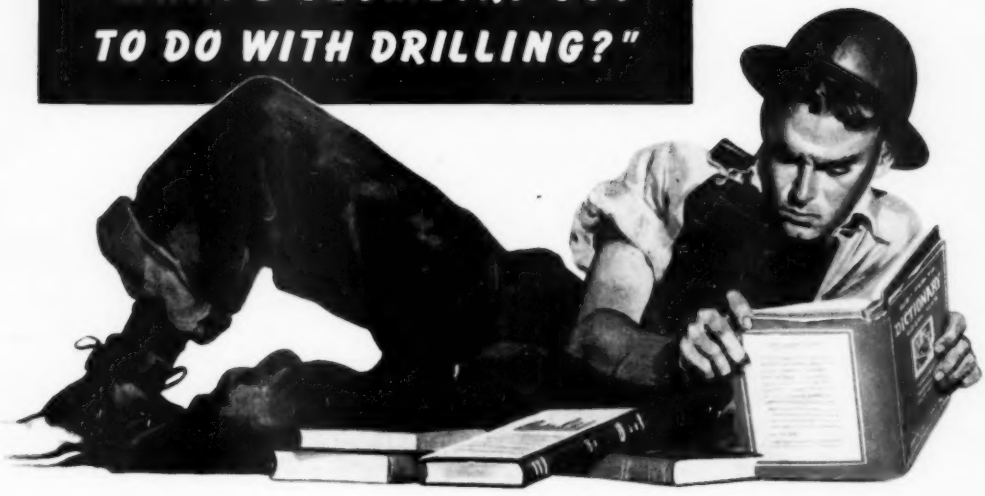
the OIL AND GAS JOURNAL

"WHAT'S GEOMETRY GOT TO DO WITH DRILLING?"



"Geometry plays quite an important part in successful hole making . . . in example, all Hughes tri-cones have the same basic geometry . . . 3-cone construction with chisel tooth arrangement and controlled action on bottom. This basic geometry provides such advantages as intermeshing rows of teeth on the inner portion of each cone for 'self cleaning' and also permits the use of deeper teeth and larger and stronger bearings. With this geometry only rolling cutting surfaces are exposed to bottom of hole. These points of advantage demonstrate geometry in action as applied by Hughes engineers to create another Hughes 'Engineered Solution.'"

HUGHES TOOL COMPANY
HOUSTON, TEXAS
Standard of the Industry

PRICE 50 CENTS TABLE OF CONTENTS PAGE 51 MAY 26, 1949

"BT" *Pressure Recording*

Howco formation testing isolates the sand section to be tested and extracts from it the data required for proper analysis and action. Information on quantity, quality, pressures and temperatures is quickly obtained and made available in permanent, composite record form.

SEE WITH A HOWCO TESTER

The test of any testing service is the assurance of accurate results. Assurance of Howco results lies in a 20-year history of leadership maintained through constant improvement of tools and techniques to meet changing well conditions. Consult your nearest Howco representative.

Fluid Samples

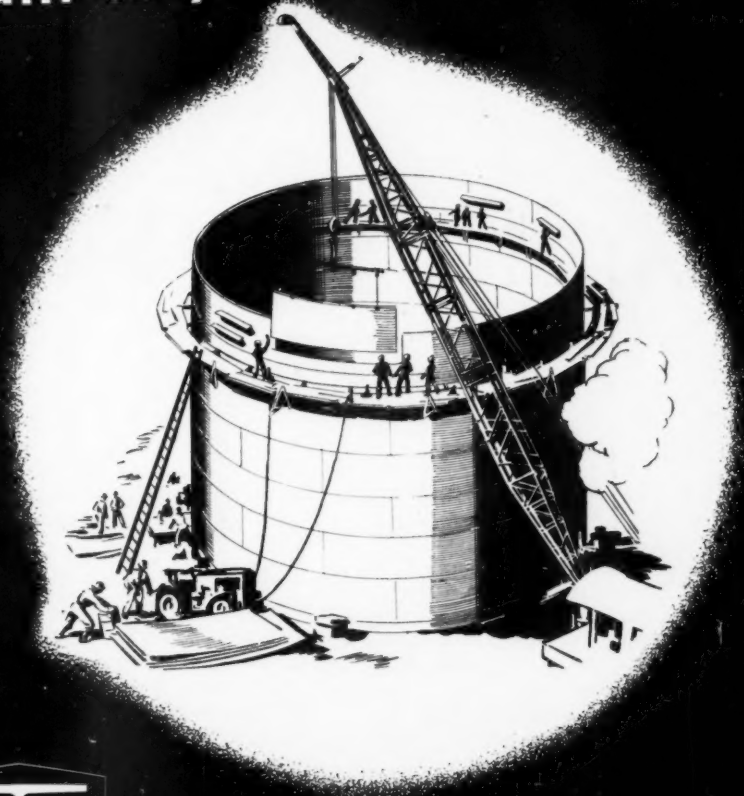
Temperature Recording

HALLIBURTON OIL WELL CEMENTING COMPANY

DUNCAN, OKLAHOMA

ALL-WELDED STORAGE TANKS

Built to your specifications



BETHLEHEM STEEL

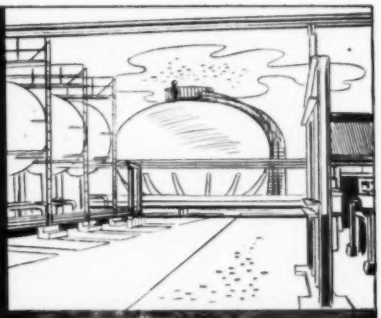
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Fabricated Steel Construction

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor - Bethlehem Steel Export Corporation

STORY OF A JOB



SHELL OIL CO., INC.
TXL GASOLINE PLANT
NOTREES, TEXAS

The best laid plans of men are frequently subjected to change by various influencing circumstances. Such was the case at Shell Oil Company's TXL Gasoline Plant near Odessa, Texas. Brown & Root, Inc., was awarded the contract to build a 30,000 mcf gasoline plant for Shell. During construction, new field development made it necessary to increase the throughput to 45,000 mcf. Shortly after completion, still further demands necessitated tripling the original capacity to handle 90,000 mcf!

We believe flexibility to meet changing conditions is the prime asset of any contractor. Brown & Root, Inc., will do ALL of your engineering and construction or will work closely with your own technical personnel to fit your needs.

BROWN & ROOT, Inc. *Engineers • Constructors*

P. O. BOX 3, HOUSTON 1, TEXAS

CABLE ADDRESS — BROWNBILT

BROWN-BILT

Associate Companies — BROWN ENGINEERING CORP. • BROWN & ROOT MARINE OPERATORS INC.

How to *INCREASE BOILER RATINGS*

with your present furnace and stack

Coppus-Dennis FANMIX Burners Give You More Heat with No Other Major Change in Equipment

Coppus-Dennis **FANMIX** Burners give you *perfect* mechanical mixing of fuel and air *at the burner outlet . . . instantaneous* ignition close to the burner . . . and *complete* combustion *without visible flame* when burning natural gas. No other burner combines these three advantages.

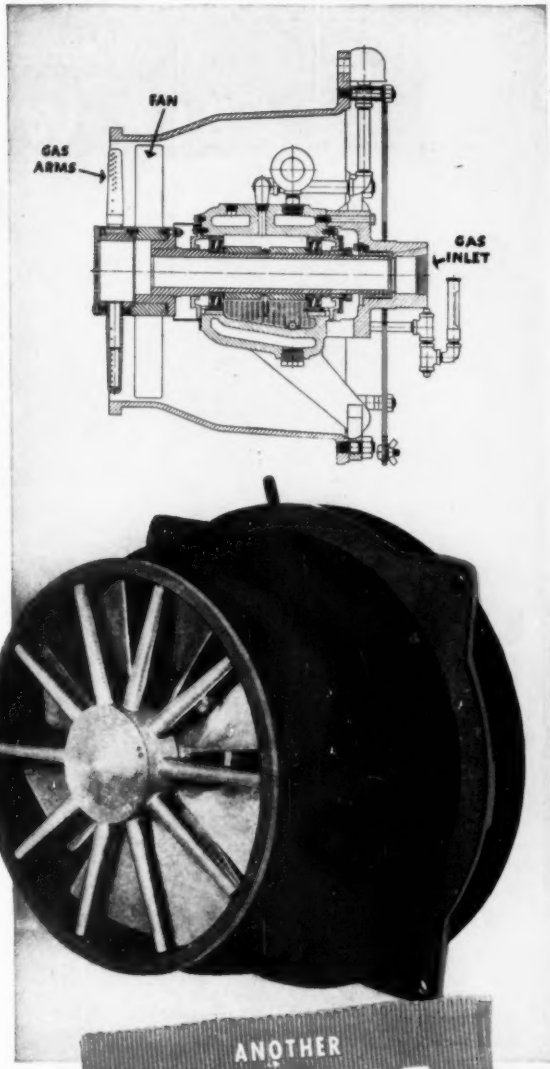
Because **FANMIX** delivers the *right* mixture of fuel and air *without blow-torch action*, all of your furnace space is used for combustion . . . *none for mixing*. That's why your present furnace can release more heat . . . why new installations can get more heat out of smaller furnace space.

Because **FANMIX** can be guaranteed to secure complete combustion of natural gas *with less than 5% excess air*, you get uniform "radiant heat" *without drifting hot spots*. That's why a **FANMIX**-fired furnace seldom varies in temperature more than 5% over its entire area.

WRITE FOR ALL THE FACTS

When you see in Bulletin 410-6 how fuel escaping from orifices in rotating driver arms rotates the fan to draw the correct proportion of air into the path of the fuel at right angles . . . how **FANMIX** creates its own forced draft, reduces stack requirements, prevents cracking of "wet" gas . . . how two **FANMIX** types handle either gas or oil or any combination of both — you'll understand why **FANMIX** Burners have such wide acceptance in oil refineries and power plants.

Send for the Coppus-Dennis **FANMIX** Bulletin 410-6. Coppus Engineering Corporation, Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other Coppus "Blue Ribbon" products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, and REFINERY CATALOG.



ANOTHER
COPPUS
"BLUE RIBBON" PRODUCT

COPPUS ENGINEERING CORP.
255 Park Ave., Worcester 2, Mass.
Please send Bulletin 410-6 to:

Name .....

Company .....

Address .....

A Marvel Among

CABLE WINCHES!

A cheap winch in a strategic location can prove to be very expensive economy. Take a cable winch for handling a swingline inside a storage tank, for instance. Suppose a pawl breaks and the swingline pipe falls to the bottom of the tank. You know what you are in for.

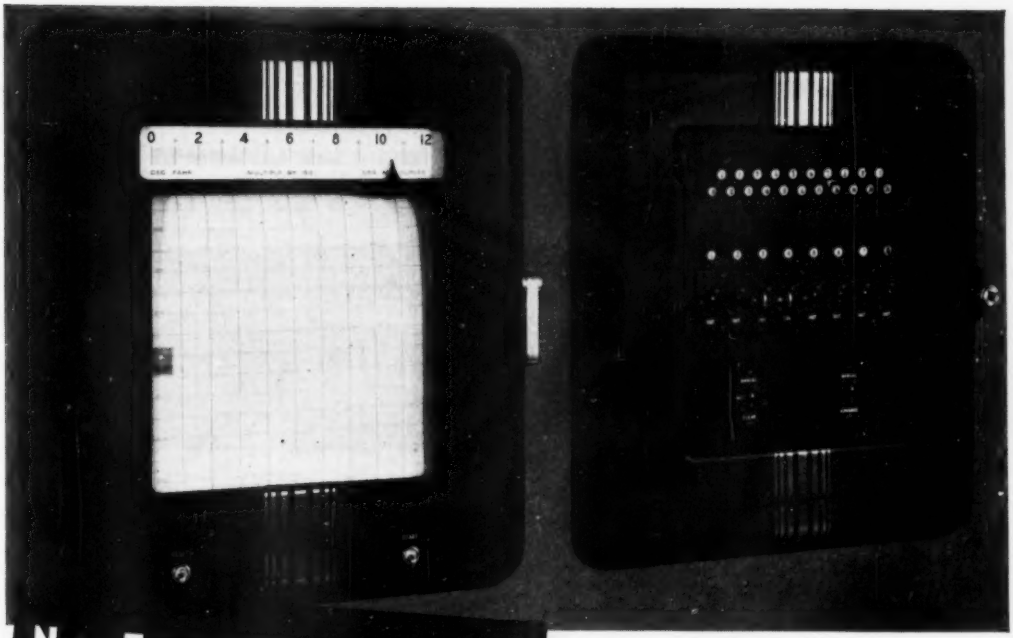
For such important service we have designed and built a quality winch of the worm and ring gear type. When you release the handle, it remains just where you left it. It cannot spin and injure anyone. It cannot drop the swing pipe suddenly. We consider the cable winch one of the most critically important components of our complete swing line equipment. May we send you descriptive literature and prices?

SHAND & JURS CO.
BERKELEY, CALIFORNIA
NEW YORK CHICAGO HOUSTON LOS ANGELES SEATTLE

S&J

SHAND & JURS

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1949.



New Temperature Instrument For Testing and Processing

Checks 160 Points In Only 10.6 Minutes!

Remarkably fast, this new Speedomax is industry's new version of the well-known L&N wartime Flight Test Recorder. It offers a definite advance in temperature checking and recording for the chemical processing industries. With Speedomax, an operator can "tour" the temperatures of 160 points in a little less than eleven minutes. He can watch the readings as they are automatically indicated; or Speedomax will record them for later examination and for the shift log.

In either case, readings are supplied in such rapid rotation that it is generally possible to determine the exact point at which any high or low temperature first develops, even though the condition may later spread to other points. Such speed of course helps both to detect and to isolate trouble.

The installation procedure is entirely standard. The user's staff simply installs thermocouples at those points from which they wish to get temperature readings. Couples are then connected to the Speedomax equipment in banks of 20 each, with as many as 8 banks. Appropiate alarms may be included.

Records When Desired

The Speedomax automatically measures at a rate of one point every 4 seconds. Signal lights wink on for each couple, and as long as temperature remains correct the instrument merely indicates . . . does not record. It can be made to record at any time, however, merely by throwing a switch. Or if any temperature reaches its predetermined limit, an alarm sounds and the Speedomax automatically records until switched off. Also, any bank or banks of couples can be switched out at any time, thus concentrating on areas of special interest.

For further information about this versatile temperature-checking equipment, write Leeds & Northrup Co., 4959 Stenton Avenue, Philadelphia 44, Penna.

Substantially the same equipment can be used for Machine, Turbine and Generator-Bearing Temperatures.

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

LEEDS & NORTHRUP CO.

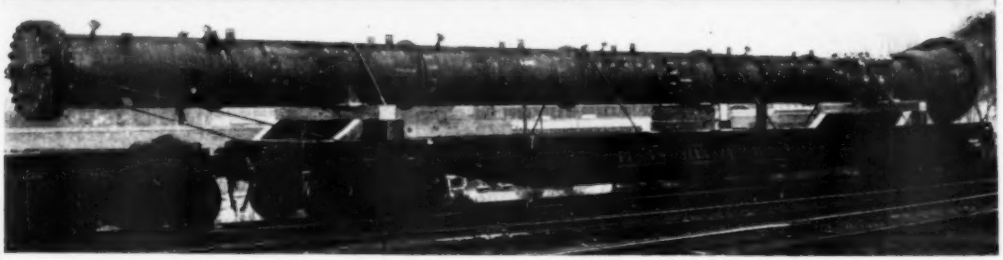
VESSEL DIVISION

NEWS

A. O. Smith 75th ANNIVERSARY 1874 - 1949

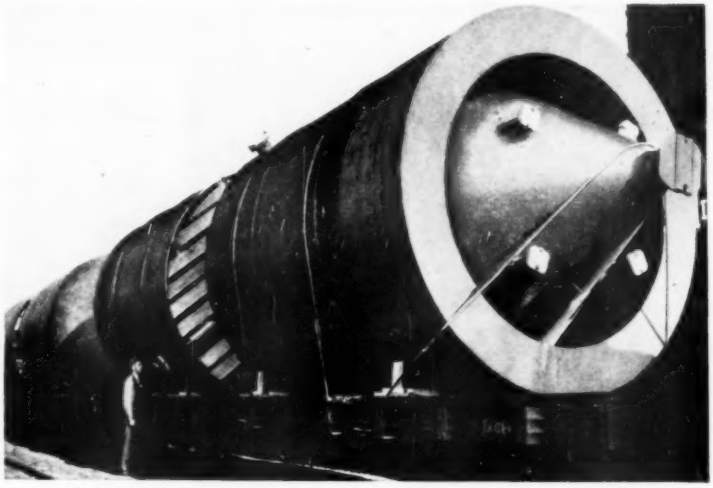
A. O. SMITH Corporation

New York 17 • Philadelphia 3 • Pittsburgh 19 • Atlanta 3 • Chicago 4
Tulsa 3 • Dallas 1 • Houston 2 • Seattle 1 • Los Angeles 14
International Division: Milwaukee 1

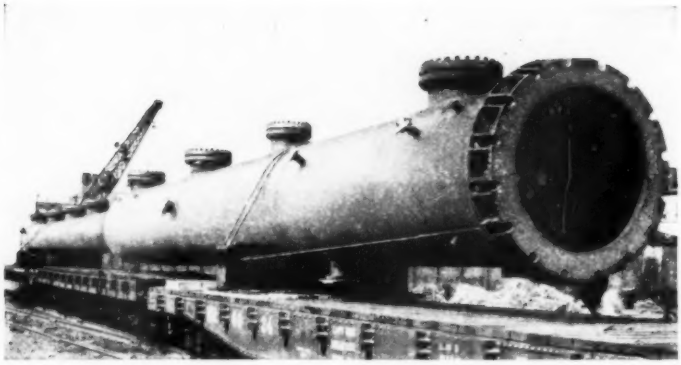


INTO EVERY SMITHlined FAT-SPLITTING TOWER, like the above 68-ft.-long SMITHway Tower, goes the experience and knowledge gained from a long and extensive program of research and development into the corrosion problems of the Fatty Acid Industry.

THREADING A NEEDLE. Getting a 12 ft. dia. by 43 ft. long paper mill replacement digester into an existing building is a difficult feat. A. O. Smith did it by shipping the SMITHlined Digesters *in sections* for final assembly and welding in place inside the paper mill.



A. O. SMITH MAKES ALL TYPES OF OIL-REFINING PRESSURE VESSELS. Here is one type, a SMITHlined Absorber Tower three railroad cars long (approximately 107 ft. long), leaving for a refinery in Ohio.



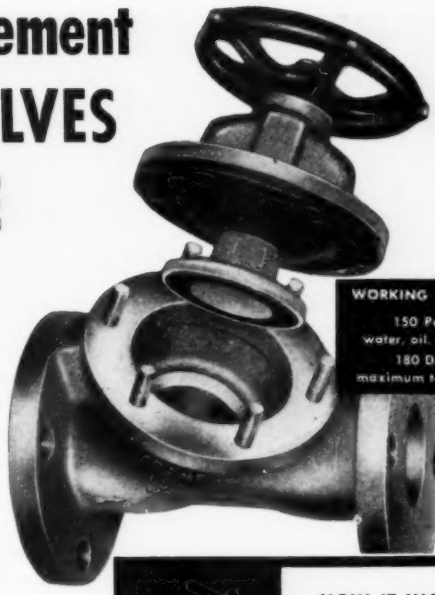
NEW BULLETINS

Write the nearest A. O. Smith office listed at the top of this page for these new A. O. Smith Bulletins:

FIELD ASSEMBLY OF PRESSURE VESSELS — Bulletin V-44.

SMITHway VESSELS, Alloy, Alloy-Lined, Clad, and Glass-Lined—Bulletin V-46.

outstanding improvement in DIAPHRAGM VALVES by CRANE



WORKING PRESSURE:
150 Pounds
water, oil, air or gas
180 Deg. F.
maximum temperature

NEW SEATING ARRANGEMENT
MORE DURABLE...
SAFER...MORE EFFICIENT

Now, after completing exhaustive tests, Crane presents this better diaphragm valve—better suited for more services under today's working conditions. Stemming from basic improvements, such as the radically new bonnet-sealing and valve-seating arrangement, this original Crane design introduces many outstanding service features like those shown here.

1. LONGER DIAPHRAGM LIFE, because diaphragm is used *only* to seal the bonnet—not for seating purposes.

2. POSITIVE SHUT-OFF in case of diaphragm failure. This is an exclusive Crane safety feature.

3. ACCURATE SEATING—new flat face disc with durable, resilient seating surface assures tight closure on all fluids.

4. GREATER FLOW CAPACITY with reduced resistance and pressure drop, assured by Crane Y-pattern body design.

5. EASIER OPERATION—Crane separate disc and diaphragm construction takes less torque—fewer turns—to operate.

HOW IT WORKS

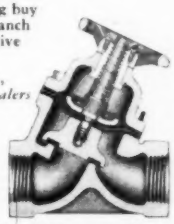
The Crane diaphragm serves one function only—sealing the bonnet. It is not subject to crushing and rapid wear. The seating member is a separate circular flat face disc, firmly attached to the stem and joined to the diaphragm with a special leakproof connection. This independent seating feature permits positive shut-off with no loss of fluid, even in case of diaphragm failure.

GET THIS DESCRIPTIVE CATALOG

See these new valves—the outstanding buy in their class—at your local Crane Branch or Wholesaler. Or write for descriptive catalog AD-1761.

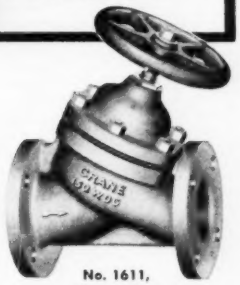
CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill. *Branches and Wholesalers Serving All Industrial Areas.*

This new Crane line includes iron valves with screwed ends in sizes ½ to 2 in.; with flanged ends from ½ to 4 in. Neoprene coated valves—flanged ends only—in sizes from ½ to 4 in.



No. 1610, screwed ends

No. 1615, flanged ends, neoprene coated



No. 1611, flanged ends

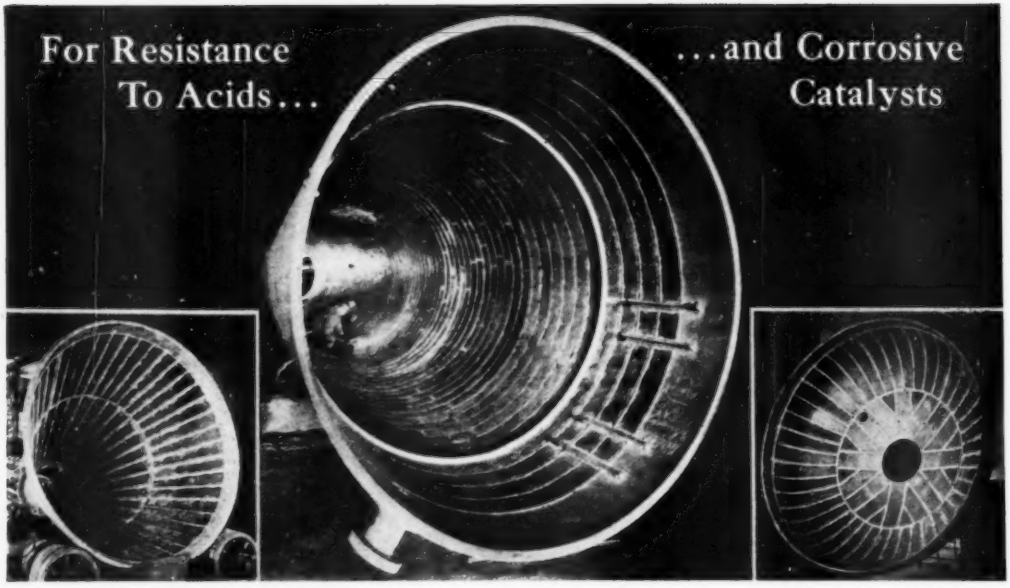
EVERYTHING FROM . . .

VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM



HASTELLOY Alloy Is Used for Isomerization Tank Linings

• This 63-foot isomerization tank is strip-lined with HASTELLOY alloy B, which effectively resists the hydrochloric acid formed when the aluminum chloride catalyst hydrolyzes.

HASTELLOY alloy, used for applications such as this, eliminates shutdown time for replacements because its high resistance to corrosive substances means longer life of equipment.

HASTELLOY alloys are available in many forms and can be fabricated into a wide variety of chemical-processing equipment. Our engineers will be glad to help you select the right grade to solve your problem of corrosion, heat, wear, or abrasion.

For further information, write for the booklet "HASTELLOY High-Strength Nickel-Base Corrosion-Resistant Alloys."

HASTELLOY Alloys Offer These Advantages:

1. Resistance to hydrochloric acid, cold or hot, dilute or concentrated.
2. Resistance to sulphuric acid, cold or hot, dilute or concentrated.
3. Resistance to oxidizing agents such as ferric chloride and wet chlorine.
4. Resistance to abrasion and wear.
5. High strength and toughness.
6. Variety of forms—castings, welding rod, mill forms, or fabricated equipment.

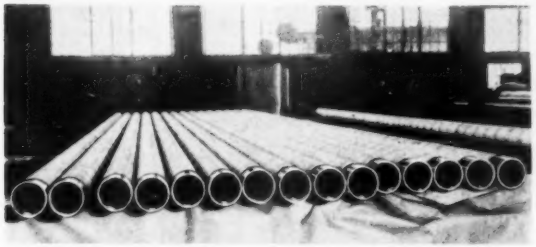
HASTELLOY TRADE-MARK

HAYNES STELLITE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Ind.
Chicago · Cleveland · Detroit · Houston · Los Angeles · New York · San Francisco · Tulsa

HIGH-STRENGTH NICKEL-BASE ALLOYS FOR CORROSION RESISTANCE

OLD IN EXPERIENCE ••NEW IN MODERN PIPE PROTECTION ADVANCEMENT~

HILL, HUBBELL HAS A 25 YEAR BACKLOG OF SATISFIED CUSTOMERS

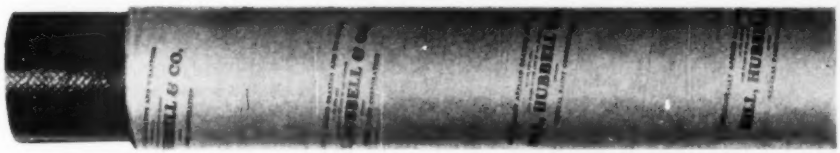


LONG SERVICE LIFE for your pipe lines is OUR BUSINESS. Our latest most modern and efficient mechanical methods for positive pipe protection, is your assurance of maximum maintenance economy for your long range investments.

Caustic dipping and rinsing tanks for removal of oil and grease, ROTO-BLAST cleaning with angular grits, warming rooms maintaining proper temperature of pipe throughout processing, mechanical kettle agitation with positive temperature control of coating materials, together with your choice of standard coatings, asbestos felt or glass wrap for your small (3/4" nominal) or large (26" O.D.) pipe sizes, are all features designed to fit your most exacting requirements.

Ample storage space is available at our plants for your bare pipe to be coated-and-wrapped in conformity to your installation schedules.

PROGRESSIVE ADVANCEMENT • • •
YESTERDAY, TODAY and TOMORROW



Hill, Hubbell and Company
Division of GENERAL PAINT CORPORATION
3091 MAYFIELD RD. CLEVELAND, OHIO.

VOL. 3, NO. 83
Petroleum Puzzle
The Refiners Can't Sell Heavy Fuel Oil as Fast As They Must Make It
"No Immediate Market" for Vast Stocks Accumulating In California Tanks
More "Cat Crackers" Wanted
By ROBERT J. SULLIVAN
Staff Correspondent of THE WALL STREET JOURNAL
LOS ANGELES—Refiners are floundering in heavy fuel oil and wondering how to get out.
Here in California, they are neck deep. They started 1948 with 21 million barrels in storage and ended up with more than 37 million.
The situation is most dramatic here in California; April figures show about 47% of the country's heavy fuel oil stocks are idling in this one state's storage tanks. Refiners here say they've been trapped by a combination of circumstances.
So the oil financiers are looking to the petroleum engineers for help. These experts know how to build huge new catalytic cracking refineries capable of taking even the heaviest crude oil and re-juggling its molecules to produce more gasoline and less heavy fuel oil.
From the April 28th issue of The Wall Street Journal
"CAT CRACKERS" FOR SALE
Don't let a surplus of heavy fuel oil absorb your profits. Get the utmost earnings by producing more saleable fractions. Treco can design and construct a catalytic cracker to make your operations more profitable. Time required? Much less than you have probably considered necessary.
Treco can give you a turn-key job in the quickest possible time, with the assurance of top-flight performance. Call Treco today for more profits in the future.
Our fleet of planes makes our office as near as your telephone. Call 5-5561 today for complete details without obligation.
TRECO
The REFINERY ENGINEERING Co.
Phone 5-5561 Tulsa, Oklahoma

Tailor-made to fit an oil man's travel pattern . . . the Beechcraft Executive Transport

Ever since introduction of this seven-to nine-place Beechcraft, men in every phase of the petroleum industry have made it the backbone of their company-owned transportation structure.

It offers 200-mph speed and exceptional traveling comfort. This versatile twin-engined Beechcraft is equally at home near oil rigs on small sod fields and on great metropolitan airports. It is superlative transportation that proves economical, too. Investigate.

● A note on your company letterhead will bring an informative 60-page brochure on "The Air Fleet of American Business." Write today to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

PREMIER OIL REFINING COMPANY
OF TEXAS
LONGVIEW, TEXAS

Mr. Walter H. Beech
Beech Aircraft Corporation
Wichita, Kansas, U. S. A.

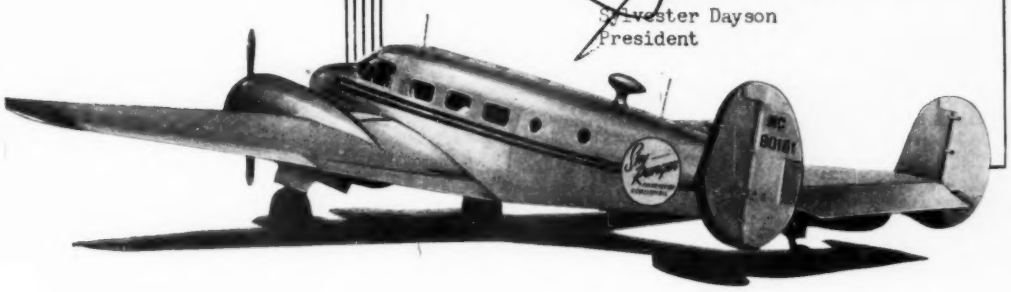
Dear Mr. Beech:

Our "Sky Ranger," the company's twin-engine Beech, flew approximately 400,000 passenger miles in one year alone, logging many trips of 1,000 miles and more to Washington, New York, Chicago, Mexico City and Guatemala.

The Beech is mainly used as a transport for executives of Premier Oil Refining Company, refiner of Sky Ranger Flight Tested Aviation Oil. We find it pays to be an air-minded company. Sales and marketing problems that need immediate attention get that attention, no matter where located.

Yours very truly,

Sylvester Dayson
President



BEECHCRAFT
EXECUTIVE TRANSPORT
MODEL 18

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

New Eastern Facilities For Peerless Pump Division On Huge Site At Indianapolis

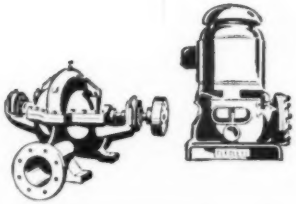
INDIANAPOLIS, IND.—Peerless Pump Division's new Indianapolis works is the former Fall Creek Ordnance Works and was acquired both for its adaptability to Peerless' long studied and applied production line for manufacture of pumps and for its strategic geographical location for quick customer service. The existing plant, based on 50 ft. x 20 ft. steel column spacing was well adapted to the setting up for high manufacture volume of pump units. Approximately 261,000 square feet of floor space (6 acres under roof) is contained in the main manufacturing building. Auxiliary building for production control, shower and locker facilities for 1200 employees, main offices, dispensary, etc., adds many thousands of square footage. Included in the main building are 24 cranes of 2 and 5 tons capacity capable of operating the entire range of each of the six 50 foot bays. Spur tracks enter both north and south sides of main factory building. A complete and rounded complement of the most modern machinery has been assembled to build up one of the most accurate and finest industrial machine shops.

NEWEST PUMP FACTORY IN THE U. S. GEARED TO HIGH SPEED PRODUCTION OF HORIZONTAL AND VERTICAL PUMPS

Peerless Pump plant at Indianapolis, Indiana

19 ACRES OF MODERN PLANT FACILITIES DEVOTED EXCLUSIVELY TO MAKING PUMPS

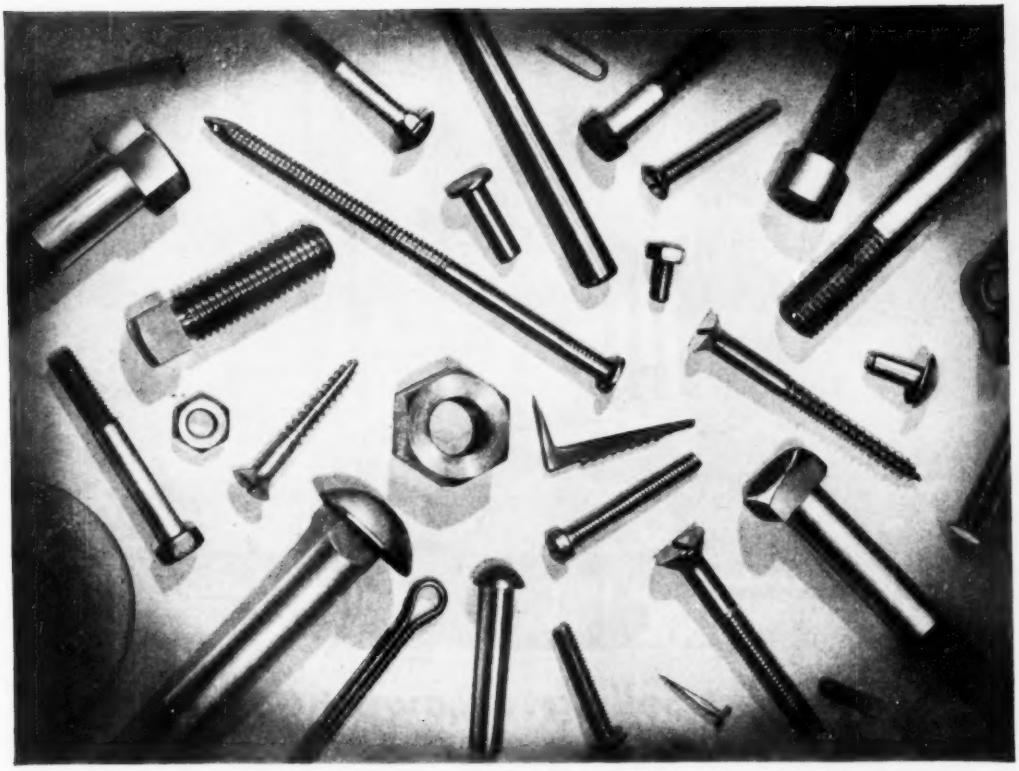
Here is one of America's most modern pump factories. Peerless Pump's new plant at Indianapolis is devoted entirely to making pumps and handling pump service. All types of pumps in the Peerless line, horizontal centrifugal, deep well and close-coupled turbines, Underwriters' approved fire pumps and domestic water systems are made and serviced in this plant. No expense has been spared in tooling Peerless-Indianapolis to insure accurate pump production; testing facilities at Indianapolis are being incorporated into one of the largest pump laboratories in the country. Add these factors to sound basic Peerless pump designs, to the high caliber of Peerless personnel and to Peerless extensive manufacturing facilities at Los Angeles, California, and they combine to make available as comprehensive pump service as is offered to pump owners and buyers anywhere. Peerless-Indianapolis is open for your inspection. You are cordially invited to see for yourself how Peerless-Indianapolis will exactly fit your needs for pumps and pump service. Plan with Peerless; there are horizontal and vertical types for most services, in all industries. Descriptive Bulletins are available on all types upon request.



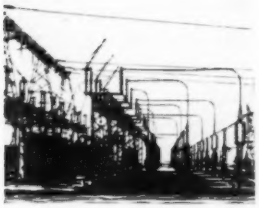
Peerless
VERTICAL AND HORIZONTAL
Pumps

fmc
PEERLESS PUMPS

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Los Angeles 31, California — Indianapolis, Indiana
District Offices: New York 5, 37 Wall Street; Chicago 40, 4554 North Broadway; *Atlanta Office:* Rutland Bldg., Decatur, Georgia; Omaha, Nebr., 4330 Leavenworth Street; Dallas 1, Texas; Fresno, California; Los Angeles 31, California



32 Ways to Keep the "Fast" in Fastenings!



How A Power Company Put Monel Fastenings To Work

In 1928, engineers of the Philadelphia Electric Company chose Monel bolts to be used on switching equipment in two new substations. Previous installations had used ferrous and non-ferrous bolts. But the life of these had been short. Atmospheric corrosion and rust had attacked them. Repeated expansion and contraction had caused them to crack and break.

Monel ended the problem. Today, 21 years later, every Monel bolt is still on the job.

IF YOU HAVE A TOUGH JOB FOR FASTENINGS, WE CAN RECOMMEND TOUGH FASTENINGS FOR THE JOB...MONEL

"Easy jobs" can be taken care of by ordinary fastenings.

For "tough jobs" you need *Monel*®.

Look at the properties that enable Monel fastenings to give you extra protection against rust... corrosion... shock... overstressing... vibration... heat... cold.

Take resistance to corrosion. A Monel fastening resists attack by alkalies, most acids and salt water ... will never rust.

Mechanical properties, too, are superior. Compare Monel with the free-cutting steel used in ordinary fastenings, and you'll find Monel is 20% stronger... 30% more ductile... 40% tougher.

Extreme temperatures are no problem either. Monel fastenings are safe at high heat or sub-zero cold.

Any type fastening you need is available in longer-lasting Monel. Look over the places in your plant or product where you want (*and need*) the extra protection of Monel fastenings.

TEST A MONEL FASTENING, FREE! Write to Bob Johnson of Inco. Tell him the type and size you want. He'll send a sample... plus the address of your nearest supplier.

EMBLEM OF SERVICE INCO

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

Reg. U. S. Pat. Off.

Monel® Fastenings are stronger..tougher..safer

Largest Selling . . . Lowest Costing

CHEVROLET ADVANCE-DESIGN TRUCKS

Lead Them All!

CHEVROLET You'll discover a new kind of value when you drive and ride in these Advance-Design Chevrolet trucks. You'll find fleetness and flexibility, power and massive strength and long-lasting quality in every feature of body, frame, cab and chassis. Yet, you enjoy all these premiums *at lowest cost*, for Chevrolet trucks have 3-WAY THRIFT—low-cost operation, low-cost upkeep and the *lowest list prices in the entire truck field!*

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

The leader offers all these features

Chevrolet's 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation in Series 3800 and heavier duty trucks. Faster shifting maintains speed and momentum on grades.

Chevrolet trucks have the famous CAB THAT "BREATHES"* Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet's power-packed VALVE-IN-HEAD ENGINE provides improved durability and efficiency as well as the world's greatest economy for its size!

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, All-Steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-floating Hypoid Rear Axles on the 3600 Series and Heavier Duty Models • Specially Designed Brakes • Hydrovac Power Brakes on Series 5000 and 6000 Models • Standard Cab-to-Axle Length Dimensions • Multiple Color Options.

**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

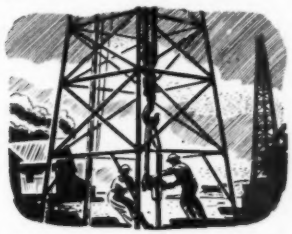
CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

Standard Oil Company (New Jersey) Reports for 1948...

A year of Progress and Results for an Oil-using World!..

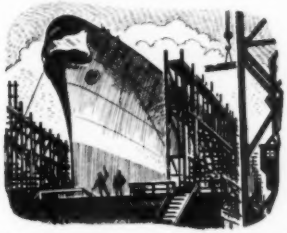
OIL SHORTAGE FEARS of a year ago have vanished. All around the world, oil resources are expanding. In doing their part to meet the rising needs for oil, this Company and its affiliates last year made the greatest efforts in their history. Here are some facts from this Company's Annual Report to its more than 200,000 stockholders . . .

1 TOTAL PRODUCTION AGAIN INCREASED. After setting new records in both 1946 and 1947, this Company and affiliates in 1948 increased crude oil production by 8% over the year before. Output of crude oil by our domestic affiliates represented 9% of the total crude produced in the U.S. Output of affiliates, world-wide, represented 14% of world production.



More wells drilled than ever before. Proved reserves increased

2 SEARCH FOR NEW OIL SOURCES SET RECORDS. More wells were drilled than ever before. Costs for this were a record $374,000,000 in 1948. Proved reserves in the earth at year's end were at a new high.



14 new Supertankers ordered, each nearly twice the size of wartime tankers

3 EVEN GREATER COSTS FOR EXPANSION AND REPLACEMENT were again required to meet rising needs for oil. Jersey Standard and affiliates spent a record $529,415,000 in 1948, even more than 1947's investment of 426 millions. For these needs and payment of dividends, money again was drawn from earnings, from borrowing, from sale of assets, and from further call on savings of past years.

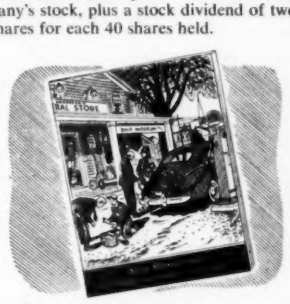
4 NEW FACILITIES RESULTED ALL OVER THE OIL-PRODUCING WORLD. In Venezuela, the world's largest pipeline was completed. Fourteen new supertankers were ordered, each nearly twice the capacity of wartime tankers. At Montreal and Edmonton in Canada; at Billings, Montana; Linden, New Jersey; and Baton Rouge, Louisiana, new refining facilities for more and better oil products went into service. At Amuay, Venezuela, a new 60,000 barrels per day refinery neared completion.

New facilities like this modern refinery help increase oil supplies

5 RELATIONS WITH EMPLOYEES CONTINUED EXCELLENT. Again there were no domestic strikes or work stoppages. At year's end the gross investment in property, plant and equipment amounted to $26,600 for each of the 129,000 employees of Jersey and its affiliated companies.

6 BOTH INCOME AND EXPENDITURES ROSE. As reported in the consolidated statement, total income of all companies was $3,332,187,000, an increase of 40% over 1947. At the same time, costs were also up 40%. $1,386,248,000 was paid for crude oil and other supplies, $573,459,000 paid to employees, $492,000,000 for other operating costs. Taxes of $268,000,000 were paid.

7 RECORD NET EARNINGS, LARGELY PLOUGHED BACK. Consolidated net earnings totaled $365,605,000. Yet this total, plus affiliates' earnings assignable to stockholders other than Jersey, plus all of the year's depreciation allowances was just about equal to the amount of money put back into the business to meet pressing needs for expansion and replacements. Stockholders of Standard Oil Company (N.J.) received dividends of $2.00 per share of the Company's stock, plus a stock dividend of two shares for each 40 shares held.



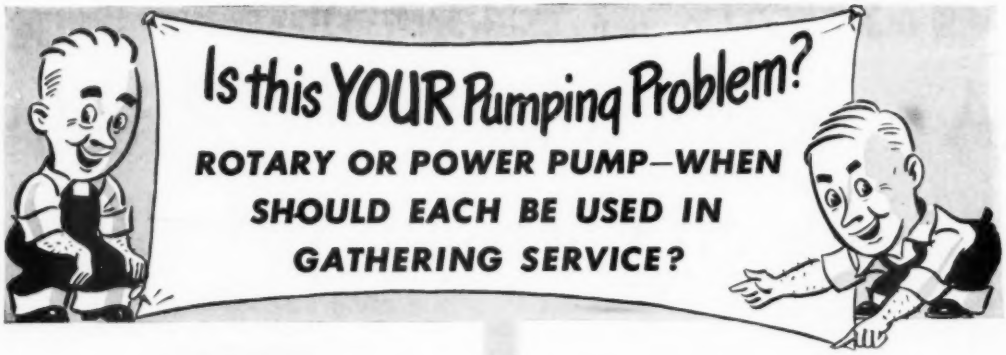
For copies of the full report write Room 1626, 30 Rockefeller Plaza, New York 20, N. Y.

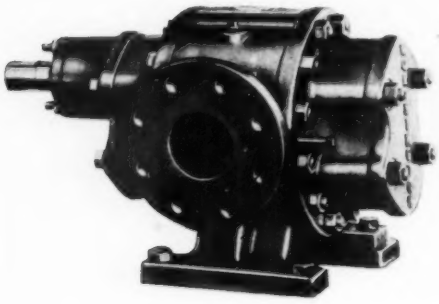
ALTHOUGH world oil consumption for the year increased 6.5%, and U.S. consumption 5.6% . . . the need was met and more. Threatened shortages were averted. Proved reserves in the earth are greater than ever before. New, modern facilities for meeting present and future needs are coming into operation throughout the world. Increasingly, human progress calls for more and more oil. In every way, the year 1948 was a year of progress and results for an oil-using world.

The better you live, the more oil you use!

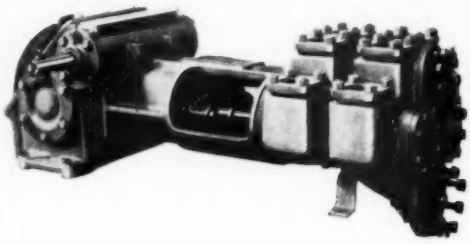
STANDARD OIL COMPANY (NEW JERSEY)

AND AFFILIATED COMPANIES





A Worthington Rotary Pump



A Worthington Power Pump

WHETHER to use a rotary or a power pump on gathering lines depends largely on capacity losses which, in turn, are affected by operating pressures. Capacity losses are minimized by: (1) close clearances between casing and pumping elements; and (2) by packing against wear to maintain these clearances.

Rotary pumps depend on close clearances alone, since packing against wear is usually impossible. Therefore, they are best for pressures of 500 psi or less, where capacity losses are negligible. Other rotary advantages for low pressure gathering duty are: light weight, portability, excellent suction qualities, self-priming ability under difficult conditions, and low original and replacement costs.

Power pumps, being packed against wear to maintain close clearances, are fortified for high pressure loads. And, since they are stationary, comparatively heavy, with easily replaceable parts, they give best results in high pressure gathering.

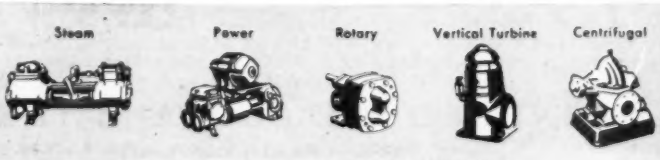
Pumps for Every Need

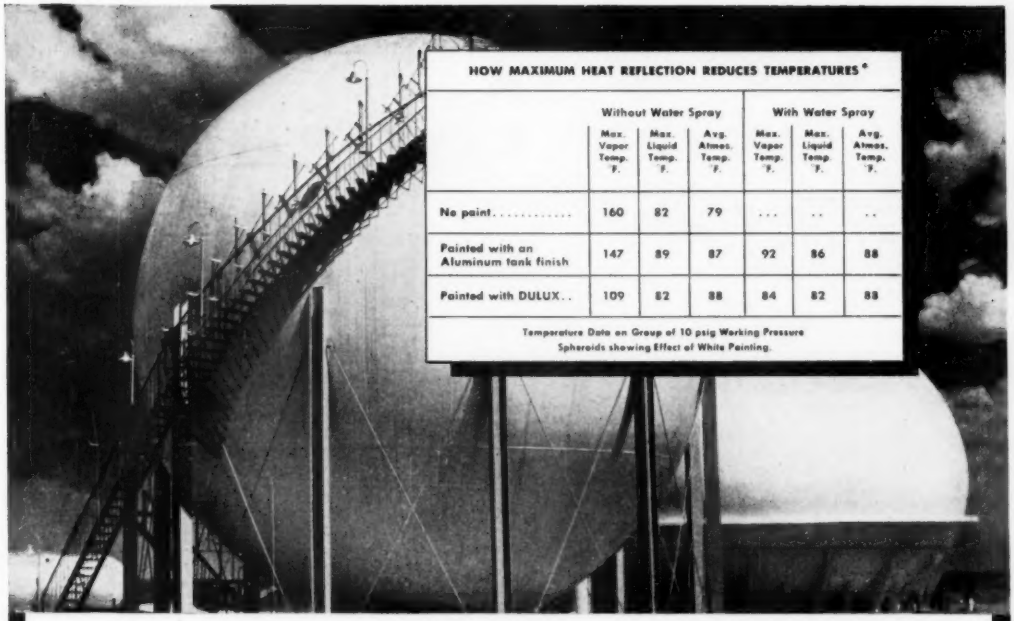
Worthington's long experience in custom-building to the oil and gas industries' special requirements assures you exactly the right type and size of pump for every job. For fact-full literature proving *there's more worth in Worthington*, drop a line, stating your pumping problems, to *Worthington Pump and Machinery Corporation, Pump and Compressor Merchandising Division, Harrison, New Jersey.*

WORTHINGTON

PCP93

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB





HOW MAXIMUM HEAT REFLECTION REDUCES TEMPERATURES*

	Without Water Spray			With Water Spray		
	Max. Vapor Temp. °F.	Max. Liquid Temp. °F.	Avg. Atmos. Temp. °F.	Max. Vapor Temp. °F.	Max. Liquid Temp. °F.	Avg. Atmos. Temp. °F.
No paint.....	160	82	79	...	..	..
Painted with an Aluminum tank finish	147	89	87	92	86	88
Painted with DULUX..	109	82	88	84	82	88

Temperature Data on Group of 10 psig Working Pressure Spheroids showing Effect of White Painting.

Du Pont DULUX Tank White

REG. U. S. PAT. OFF.

pays its own way . . . and more!

You can readily see why Du Pont DULUX Tank White is fast becoming the favorite tank finish in the petroleum industry when you study the chart above. It shows how the superior heat-reflecting ability of DULUX *lowers* interior tank temperatures . . . and thereby *minimizes* heavy evaporation losses in warm weather.

Using DULUX pays other dividends, too. DULUX provides unusually high resistance to premature corrosion, common fumes and industrial gases. DULUX means low repaint costs because less extensive surface preparation is required. And through its self-cleaning feature, DULUX stays white . . . gives *years* of maximum heat reflection!

To get long-term protection at low maintenance cost . . . to preserve the quantity and quality of your product at its peak . . . finish with Du Pont DULUX Tank White!

READ HOW *Du Pont DULUX Tank White can save you money two important ways. Send coupon today for "BEAT THE HEAT," an informative booklet complete with charts and other technical data on DULUX.*

Send for Free Booklet Today!

*Table from National Petroleum News, Technical Section

E. I. du Pont de Nemours & Co. (Inc.)
Finishes Div., Dept. O-95 Wilmington 98, Delaware.

Please send, free of charge, your new illustrated booklet **"BEAT THE HEAT."**

*Name*_____ *Title*_____

*Firm*_____

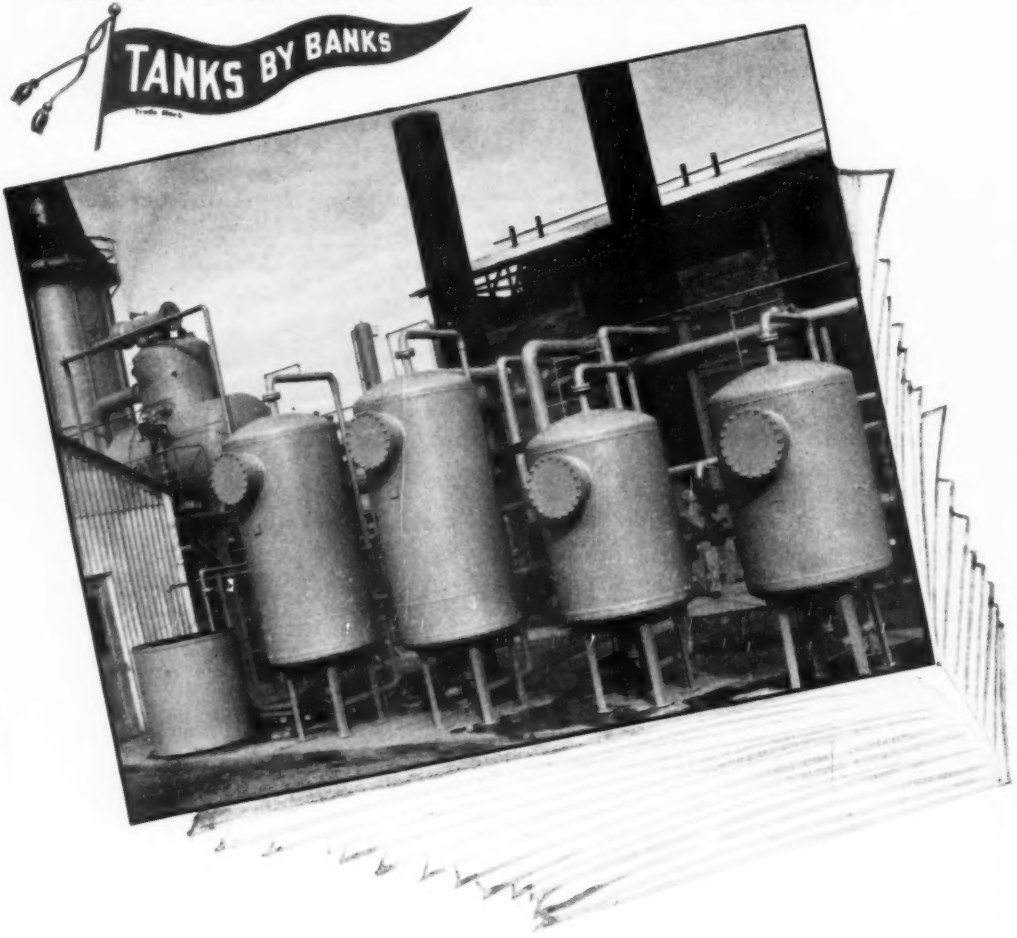
*Address*_____

*City*_____ *State*_____

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

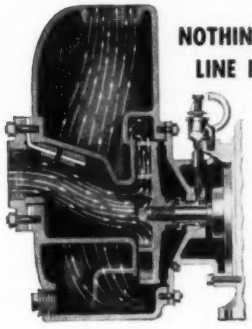
TOPS IN . . .
REFINERY EQUIPMENT



***TANKS BY BANKS** means refinery equipment of top quality from drafting board to completed fabrication.*

DALLAS TANK COMPANY, INC.
201-5 W. Commerce Street • P. O. Box 5387
DALLAS, TEXAS

BARNES PUMPS give me 33,000 for 1 odds . . .



NOTHING BEATS A STRAIGHT LINE FOR GETTING THERE

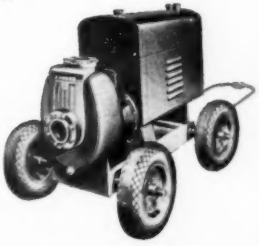
See how the suction of Barnes Pumps is direct-in-line with the impeller? This means less friction loss—more water for your pumping dollar every time with Barnes "33,000 for 1" Pumps.

THAT'S RIGHT! Not 1,000 for 1! Not 10,000 for 1! But 33,000 gallons of water pumped for 1 gallon of gas used! That's filling or emptying 4⅛ tank cars on just 1 gallon of fuel. There's no gambling on odds like these. And this amazing economy is yours when you use Barnes Automatic Centrifugals—the "33,000 for 1" Pumps.

STREAMLUXE Barnes LINE

FROM 3,000 TO 90,000 G. P. H.

A choice for every need! Barnes Complete line ranges from 3,000 to 90,000 G.P.H. in capacities. From 3-in. to 6-in. suction and discharge diameters. Buy the Best—Buy Barnes.



BARNES MANUFACTURING CO.
MANSFIELD, OHIO

MAIL THIS COUPON TODAY!

Barnes Manufacturing Co.
611 North Main Street
Mansfield, Ohio

Please send me descriptive literature on pumps marked below:

____Gasoline-engine driven automatic centrifugals
____Universal-belt driven automatic centrifugals
____Diaphragm Pumps

Name _____
Firm _____
Address _____
City _____

VALVE ACTION PERFECT!
Naturally - they're all
POWELL VALVES

Faulty valve performance can be as serious in the industrial plant as it is in the human heart.

Today, many plants throughout the United States have eliminated valve trouble by standardizing on Powell Valves. That's because, in designing *every* valve in the complete Powell Line, maximum performance at a minimum cost of maintenance has been a prime consideration. Also, because there's a Powell Valve specifically adapted to every known flow control requirement, failures due to misapplication are avoided.

So, whether you're making a new installation or need replacements, be sure to specify Powell Valves. And remember Powell Engineering Service is always at your disposal in selecting the correct valves to meet your individual requirements.

Fig. 3003—Class 300-pound Cast Steel Gate Valve with flanged ends, outside screw rising stem, bolted flanged yoke and tapered solid wedge.

Powell Valves are made in Bronze, Iron, Steel and a wide selection of Corrosion-Resistant metals and alloys. Valves of every type—Globe, Angle, Gate, Check, Non-return and Flush Bottom Tank Valves—are included in the Complete Powell Line.

Fig. 375—200-pound Bronze Gate Valve. Screwed ends, union bonnet, inside screw rising stem and renewable "Powellium" wear-resisting nickel-bronze disc.

Fig. 1708—200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable wear-resisting "Powellium" nickel-bronze disc.

Fig. 559—125-pound Iron Body Bronze Mounted Swing Check Valve. Flanged ends, bolted flanged cap and regrindable, renewable bronze seat and disc. Disc, when wide open, permits full, unobstructed flow through valve body.

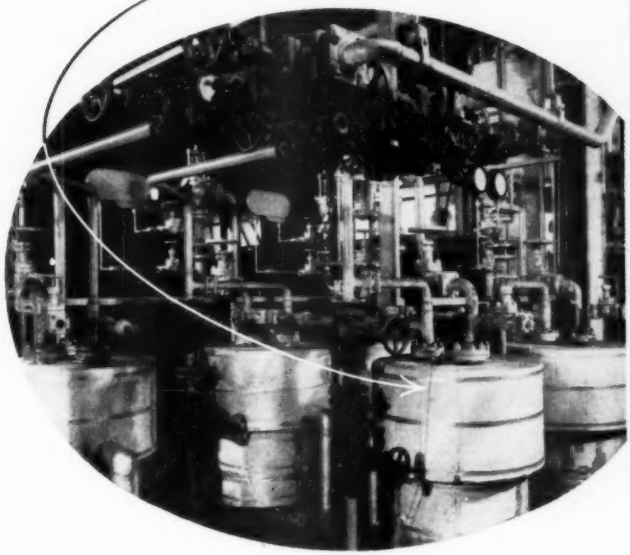
The Wm. Powell Co., Cincinnati 22, Ohio

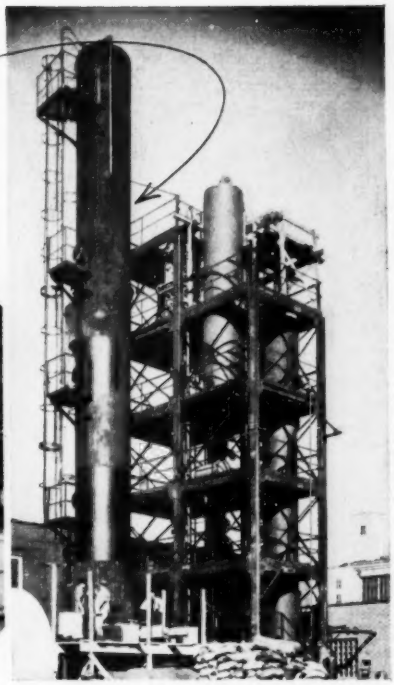
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

INDOORS AND OUTDOORS

for cold work • for hot work





PC FOAMGLAS

-the permanent insulation

This is FOAMGLAS®

The entire strong, rigid block is composed of millions of sealed glass bubbles. They form a continuous structure, so no air, water, vapor or fumes can get into or through the Foamglas block. In those closed glass cells, which contain inert air, lies the secret of the material's permanent insulating efficiency.

For additional information see our inserts in Sweet's Catalogs

● This rugged insulating material will help you to maintain a wide range of desired temperatures on outdoor and indoor tanks, towers, retorts and other large vessels. It has proved effective also on hot and cold piping, heat exchangers, evaporators and other processing equipment.

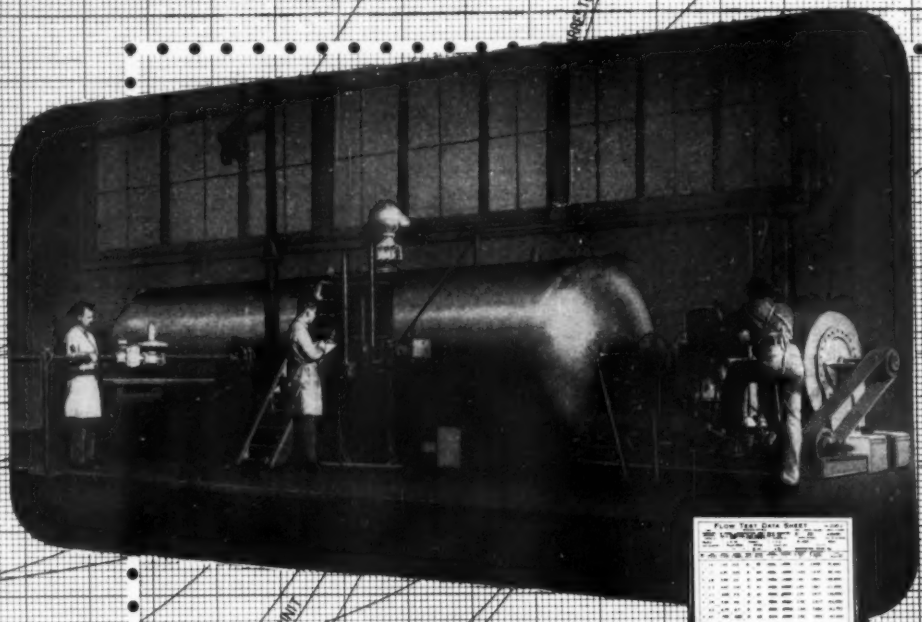
PC Foamglas is a true glass in cellular form. Therein lies the secret of its excellent insulating properties. Being glass, it is moisture-proof, fireproof, and acidproof . . . does not rot, check, warp, swell or shrink. When installed according to our recommendations and specifications, PC Foamglas retains its original insulating efficiency permanently.

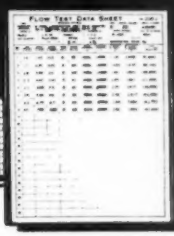
When you are figuring on insulation, be sure you have the latest information on PC Foamglas. Our insulating specialists will be glad to consult with you, to determine where and how you can use PC Foamglas most effectively and economically. Just drop a line, without obligation, to Pittsburgh Corning Corporation, Dept. S-59, 307 Fourth Avenue, Pittsburgh 22, Pennsylvania.

PITTSBURGH PC CORNING

FOAMGLAS INSULATION

When you insulate with Foamglas ...you insulate for good!





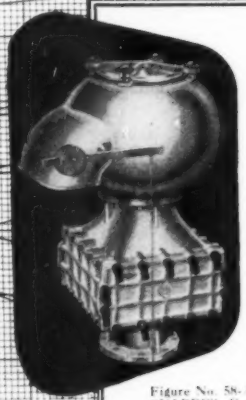


Figure No. 58-A. "VAREC" Conservation Vent Unit.

LABORATORY ASSURANCE . . .
FIELD INSURANCE . . . .

Optimum tank protection means selecting venting equipment which has adequate flow capacity to meet all your tank venting requirements. You can compute these requirements on the basis of the "VAREC" formula as described in the "VAREC" P-7 Handbook and Catalog or you can use any other acceptable tank venting standard. Adequate flow capacity, however, should be determined by actual test.

The Vapor Recovery Systems Company continuously makes such tests in their modern flow test laboratory. Flow curves for all "VAREC" Vent Valves, Flame Arresters and Vent Units are modified as design improvements are made. These flow curves accurately indicate the minimum size that will meet your venting requirements. The latest curves are available upon request. The "VAREC" flow testing apparatus and laboratory also are at your service for any special flow problems. Write today.

P-9

PROVED and APPROVED

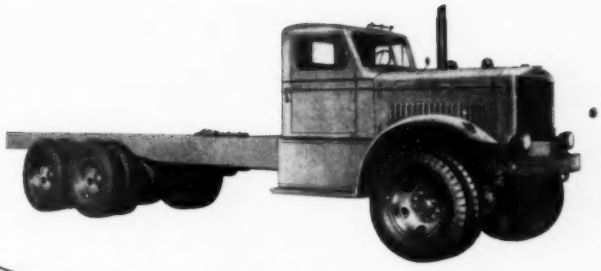
"Varec"

THE VAPOR RECOVERY SYSTEMS COMPANY
COMPTON, CALIFORNIA, U.S.A.

NEW YORK 30 CHURCH ST. PITTSBURGH 939 GULF BLDG. CHICAGO 122 SO. MICHIGAN AVE.

TULSA 409 TULOMA BLDG. HOUSTON 821A M.&M. BLDG.

CABLE ADDRESS: VAREC COMPTON (ALL CODES)



Be careful who you're calling an ordinary truck

In the Oil Industry Oshkosh Trucks are used for the Moving and Operation of:

- Drilling and Servicing Equipment
- Boilers
- Pumping Units
- Chemical Treating Units
- Cementing Units

Rugged, sturdy performers in many industries for more than a quarter of a century, there are now Oshkosh Truck models especially designed for the oil fields.

OSH says he gives outstanding performance and low cost operation because he's built for the job.

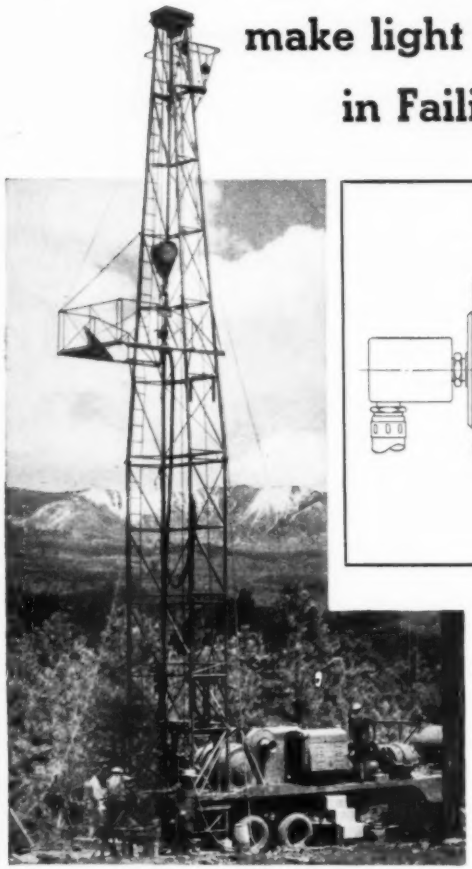
There are two reasons why he's good in the oil fields:

First, Oshkosh engineers made a thorough study of oil field truck requirements when it was decided to manufacture trucks for the oil industry. To the more than 25 years of Oshkosh "know-how" in making trucks for many other industries was added the knowledge gained in these studies. The result is a line of truck models specially designed for oil field use, and adapted to your specific needs in hauling, load-moving and the powering of drilling, servicing and auxiliary equipment. Second, users of Oshkosh Trucks—and there are many throughout the oil industry—say that Oshkosh Trucks have proved their worth under all conditions encountered in the oil fields.

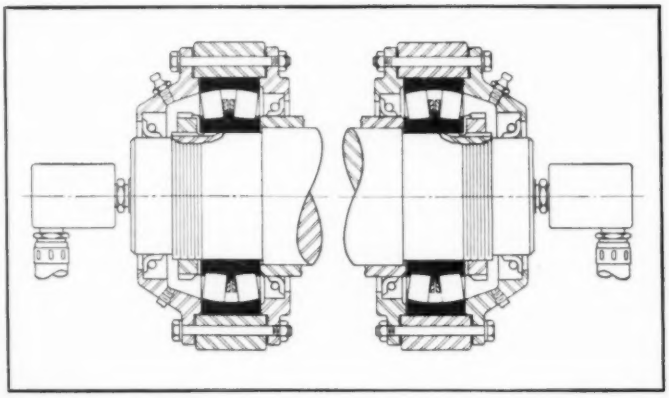
OSHKOSH MOTOR TRUCK, INC.
OSHKOSH, WISCONSIN
WRITE FOR LITERATURE

Mid-Continent Representative
GARDNER-PRICE COMPANY
728 Wright Building
Tulsa 3, Okla.

Torrington Spherical Roller Bearings make light work of heavy loads in Failing portable drilling rigs



The Model "2500" Holemaster Drill, made by Geo. E. Failing Supply Company, handles a 30,000-pound drill pipe load. Two Torrington Spherical Roller Bearings make light work of the heavy loads imposed on the hoisting drum shaft.



These bearings, shown here in cross-section, afford line contact under load for tremendous radial capacity. This capacity is always available, even under deflection, since Spherical Roller Bearings are automatically self-aligning.

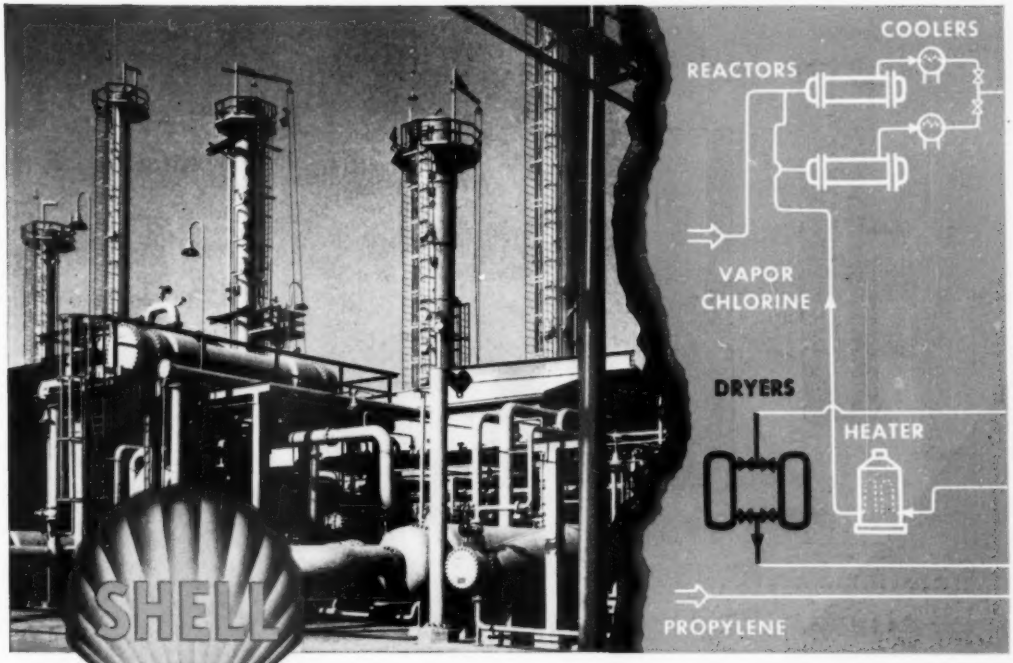
Traveling blocks are equipped with Torrington Type NCS Bearings for smooth, reliable operation. The use of selected fine steels, modern heat-treating practice and precision workmanship in Torrington Bearings assure long service life.

The application of Torrington Spherical Roller Bearings to your oil field equipment will improve performance, lengthen service life and make light work for maintenance. Our engineers will be glad to lend a hand in their application. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities of United States and Canada.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

Spherical Roller • Tapered Roller • Straight Roller

Needle • Ball • Needle Rollers



SELECTS **ALCOA ACTIVATED ALUMINA**

FOR WORLD'S FIRST SYNTHETIC GLYCERINE PLANT

Close control of reactions is one of the many secrets of success in Shell Chemical Corporation's new synthetic glycerine plant. The raw material, propylene, must be quite pure as well as dry. Side reactions which introduce extraneous compounds make the desired reaction more difficult to complete.

It is essential, therefore, that the desiccant used for drying the raw material must, itself, be *pure*, *uniform* and *highly inert*. Such specifications as these are met every day by the regular production quality of ALCOA Activated Alumina—the desiccant which Shell selected for their unique process.

ALCOA Activated Alumina is a commercially pure chemical. It adsorbs water without objectionable changes in form or properties. It does not swell, soften or disintegrate. ALCOA Activated Alumina has high resistance to shock and abrasion, is non-corrosive and practically iron-free.

ALCOA Activated Alumina dries gases, vapors and organic liquids to dew points as low as *minus* 100° F. Yet its stability and purity make it an economical desiccant where higher dew points suffice.

Why not get *all* the facts regarding this outstanding drying agent? We'll gladly furnish you with complete information. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 1967 Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM

ALCOA CHEMICALS

ALUMINAS AND FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • LOW SODA ALUMINAS • TABULAR ALUMINAS • HYDRATED ALUMINAS
ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE

you always can rely on CP drill collar quality

To assure uniform hardness, straightness and concentricity, CP Drill Collars, forged from chrome nickel alloy steel, are —

- **overall hardened by vertical quenching to assure straightness and freedom from distortion strains;**
- **bored from one end only to avoid offsets in the bore;**
- **finish turned on the outside concentrically with the bored hole.**

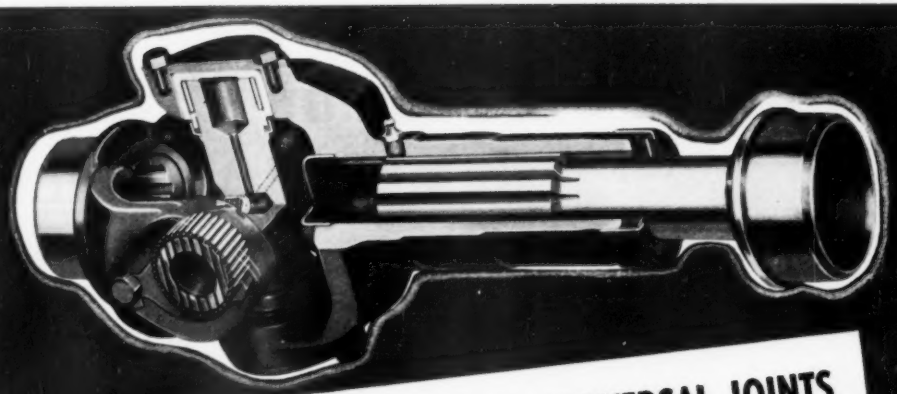
Connections on drill collars are furnished to customer's specifications. Popular size CP Drill Collars are carried in stock for immediate delivery, and other lengths, up to 55 feet, can be supplied on special order.

CHICAGO PNEUMATIC TOOL COMPANY

MANUFACTURED AT FRANKLIN, PA.

GENERAL & EXPORT OFFICES: 6 EAST 44th STREET, NEW YORK 17, N. Y.

Oil Tool Sales Office: One N. W. 16th Street, Oklahoma City, Oklahoma



Spicer

NEEDLE BEARING UNIVERSAL JOINTS

Offer Exclusive Features for Exceptional Services

Design—Rigid one piece forged steel yokes and journal cross carry full torque load and provide precision needle bearing alignment. Simple—sturdy—reliable.

Material—Carefully heat-treated steel forgings to resist fatigue and shock loads. File-hard bearing surfaces to resist wear.

Accuracy—Precision fits and surface finishes assure vibrationless, trouble-free, dependable operation.

Balance—Spicer has unequalled facilities for maintaining very close limits of static and dynamic balance in all units.

Lubrication—After initial pressure lubrication, centrifugal action distributes reserve lubricant to bearing surfaces. Centrally located lubrication fittings allow refilling of lubricant reservoirs with shaft in installed position, without affecting original assembly or balance.

Types and Sizes—Every need in the automotive, industrial, and agricultural field is met by Spicer's broad range of designs and sizes.

Spicer engineers will help adapt Spicer Needle Bearing Joints to your particular needs.

SPICER MANUFACTURING
Division of Dana Corporation
TOLEDO 1, OHIO

45 YEARS OF Spicer SERVICE

TRANSMISSIONS • PASSENGER CAR AXLES
CLUTCHES • PARISH FRAMES • STAMPINGS
TORQUE CONVERTERS • UNIVERSAL JOINTS
SPICER "BROWN-LIPE" GEAR BOXES
RAILWAY GENERATOR DRIVES

Fascinating facts about your business

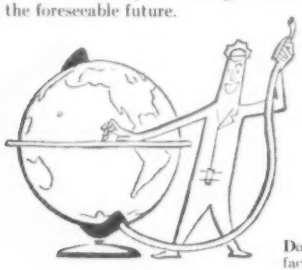
(Here are a few interesting things about oil and oil people to help you "talk up" the oil business to friends and customers. The better people understand your industry the better they'll think of you.)

If the circus trapeze artists look happier these days, oil people can take a bow. Rope burn, long an occupational ailment of aerial performers, is now largely a thing of the past—thanks to a tubular sleeve of wicking that protects the performers from the burning, abrasive action of manilla ropes. Wicking is the material used in central draft lamps, oil stoves and portable oil heaters—one more of the thousand and one products produced by Petroleum.

Credit the oil industry with the first real advance in surveying methods since the Pyramids. For 5000 years, the shape of the earth's surface has been measured with rod and level—by men working their way on foot through snow and blistering heat. Comes now the answer to a surveyor's dream—an auto-drawn elevation measuring device which permits travel in comfort, helps cover up to sixty miles a day compared to eight miles averaged with traditional methods. Chalk up one more exhibit in the record of Petroleum's Progress.

Scientists predict that two million acres of land now lying idle in the Southwest can now be brought back into production—with the help of new soil fumigants developed by oil. Slated for rough treatment at an early date are the nematodes—which attack thousands of plant species, including tomatoes, cabbage, corn, tobacco and citrus. Here is another example of how oil research helps farmers produce more of your urgently needed food.

Oil exploration is now taking to the air with an amazing airborne magnetic device. So sensitive that it measures one part in 50,000 of the earth's magnetic intensity, this new device speeds up exploration a thousand fold. Immense stretches of ocean, impenetrable mountains and bleak arctic tundra, where great new reservoirs of oil may lie waiting, can now be expected to give up their secrets in the foreseeable future.



Next time somebody mutters a warning about the end of oil supplies being imminent, here are some facts you can offer: Since 1859, when oilmen first began to punch and drill holes into the earth, they have found some 128 billion barrels of crude oil, of which 58 billions have been produced. They're finding more all the time, faster than we're using it up right now. And scientists estimate that if present supplies should ever be depleted, oil shales and coal deposits would assure adequate supplies of liquid fuels for at least 1000 years.

Do you have any interesting facts about the oil business to pass along? We'll pay $10 for every item used in this series.

OIL BUILDS FOR AMERICA'S FUTURE

Oil Industry Information Committee
670 Fifth Avenue · New York 19, N.Y.

3 reasons why it pays to

1 EVERY ORDER GETS SPECIAL TREATMENT

2 BOVAIRD BRINGS YOU THE BEST IN OIL FIELD EQUIPMENT

DRILLING
PIPE LINE
PRODUCING
REFINING

3 STRATEGICALLY LOCATED STORES FOR FAST, CONVENIENT SERVICE

BOVAIRD'S 78 years' experience in the supply business is yours when you "Buy From Bovaird." Our field salesmen are constantly checking field conditions in order to meet your specific needs. You'll find complete stocks of highest quality supplies in every BOVAIRD Store.

BOVAIRD Stores are maintained by personnel specially trained to help you select the right supplies for your job.

BOVAIRD Stores are strategically located in Illinois, Kansas, Oklahoma and Texas to give you quick, dependable, one-stop service.

WHEN YOU THINK OF SUPPLIES —— THINK OF BOVAIRD

SUPPLY BOVAIRD COMPANY

OFFICES AND STORES

ILLINOIS—Clay City, Grayville, Salem
KANSAS—Chase, McPherson, Pratt, Russell, Wichita
OKLAHOMA—Duncan, Oklahoma City, Pauls Valley, Sapulpa, Seminole
TEXAS—Borger, Dallas, Odessa, Pampa

"Buy From Bovaird"

THE BOVAIRD SUPPLY CO.

GENERAL OFFICES: TULSA, OKLAHOMA

Accuracy...

air-actuated

(Above) This field service unit operated by the Schlumberger Well Surveying Corporation, Houston, Texas, uses a Twin Disc Model P-214 Air-actuated Clutch to operate a winch capable of withdrawing 18,000 feet of cable from an oil well at cable speeds between 800 and 50,000 feet per hour.

(Left) Twin Disc Model P-214 mounted on the jackshaft.

(Extreme Left) Twin Disc Model P Air-actuated Clutch.

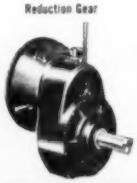
Cable control during electrical well logging is a delicate business—putting a heavy demand on the clutch for a smooth engaging action.

Accurate measurements from delicate electrical instruments are assured when specialized oil field service units are equipped with Twin Disc Model P or PH Air-actuated Clutches.

Air actuation makes the clutch engagement smooth and accurate, as well as slip free—regardless of the frequency of engagement. Whether you need brute strength or feather touch from your clutch, Models P or PH are the answer.

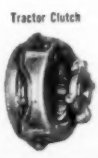
Designed for installations where precision operation by remote control is desired, Twin Disc Air-actuated Clutches are available in sizes from 14″ to 42″, and with capacities from 75 to 1325 hp. For complete information, write for Bulletin 139-A. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

Hydraulic Torque Converter


Reduction Gear

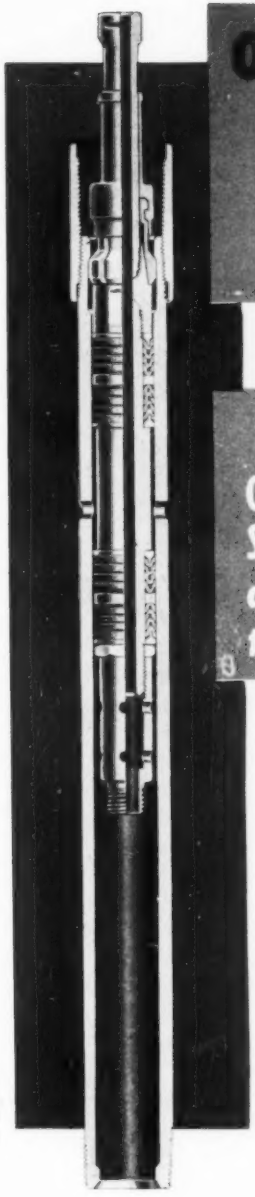
Machine Tool Clutch

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.


Tractor Clutch

Marine Gear

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918



over 18 different single and two-zone operations can be performed with

OTIS REMOVABLE SIDE-DOOR CHOKES *and supplementary two-zone equipment*

The broad range of types and adaptability of Otis single and two-zone completion and production equipment does not limit its use either geologically or mechanically. Here are some of the standard applications:

Bringing in both zones simultaneously of a dual well through the tubing, then producing each zone separately; bringing in a single-zone well through the tubing after surface connections have been permanently installed; testing tubing for leaks before a single or two-zone well is brought in; killing a single or two-zone well immediately without waiting for wire line equipment; conditioning mud above the packer of a single-zone well; acidizing or taking bottom hole pressures of a single-zone well; acidizing separately or taking separate bottom hole pressures of each zone of a two-zone well; admitting gas injected into the annulus, or gas from the upper portion of the formation above a packer, at a controlled rate to assist flow through the tubing; reducing gas-oil ratios to provide more efficient flow from both zones of a two-zone well, etc.

Otis engineers and trained personnel are available to discuss all standard and special applications of Otis single and two-zone completion and production equipment. Write Otis Pressure Control, Inc., Box 7206, Dallas, Texas. Ask for our 16-page, 4-color, illustrated "Side-Door Choke" catalog.

PRESSURE CONTROL — OTIS — SERVICE - EQUIPMENT

SIDE DOOR CHOKES

(7-25)

DISTRIBUTORS: **OTIS PRESSURE CONTROL, INC.**, DALLAS, TEX. **OTIS EASTERN SERVICE, INC.**, BOLIVAR, N. Y. **WESTERN PRESSURE CONTROL**, LOS ANGELES, CALIF. FIELD OFFICES: **TEXAS**: HOUSTON, CORPUS CHRISTI, FALFURRIAS, VICTORIA, ODESSA, and LONGVIEW. **OKLAHOMA**: OKLAHOMA CITY. **LOUISIANA**: NEW IBERIA. **MISSISSIPPI**: BROOKHAVEN. EXPORT SALES AND SERVICES: **OTIS PRESSURE CONTROL EXPORT, INC.**, POST OFFICE BOX 7206, DALLAS, TEXAS, U. S. A. CARACAS, SOUTH AMERICA. MANUFACTURE AND DEVELOPMENT: **OTIS ENGINEERING CORPORATION**, POST OFFICE BOX 7206, DALLAS, TEXAS, U. S. A.

Compare it on ANY count

Industry's *new* steam drive

Here's the new general-purpose turbine that meets the increasingly rigid demands of modern industry. Wrapped up in one *standard* unit are the best features of previous Westinghouse drives . . . plus important refinements and new developments, including features formerly obtainable only as costly "specials".

The new "Type E" is designed to operate reliably and efficiently where the going is tough. It's built to give trouble-free, economical performance for long periods of continuous operation . . . or instant operation when used as a standby drive . . . regardless of operating conditions.

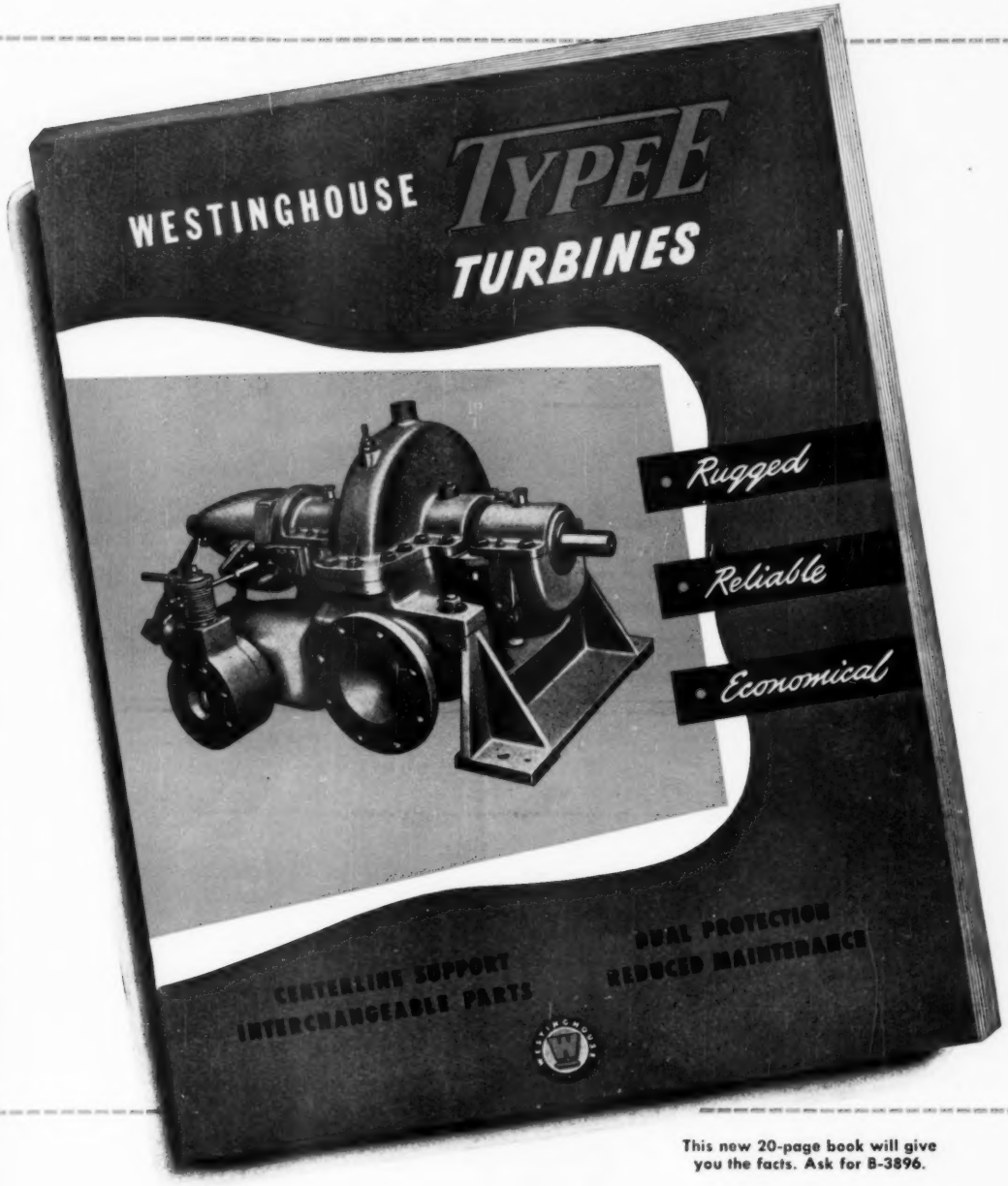
Weatherproof bearing seals, corrosion-resisting gland zones, centerline support for freedom of expansion and contraction, dual protection against overspeed, floating movement of governing and trip linkages, and parts interchangeability between wheel sizes are among the many advantages built into the new Type E drives.

We invite your comparison. For the full story, call your nearby Westinghouse office. Ask for the "Type E" Turbine book B-3896, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-50498

Westinghouse
TYPE E
Turbines

YOU CAN BE **SURE**.. IF IT'S

Westinghouse



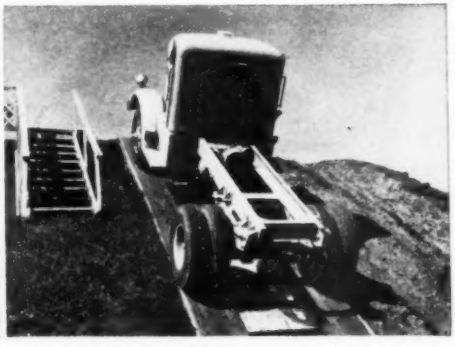
This new 20-page book will give you the facts. Ask for B-3896.

PROOF - *not Guesswork*

Makes FWD America's Foremost Heavy-Duty Truck

Here's actual operating proof in oil field service. This FWD six wheeler is hauling a heavy load of supplies up miles of mountainous gravel road with grades from 5 to 20 per cent. But that's no problem for an FWD. With front wheels pulling and back wheels pushing you climb the steepest hills surely . . . climb them safely. You know you will because FWDs are scientifically tested on FWD's proving ground to climb 70% grades from a standstill. *No wonder many of the World's leading oil field operators standardize on FWDs — with individual fleets of over 600 units!*

WHAT FWDs DO ON THE PROVING GROUND
1 Highball over hilly curved roads!
2 Slog thru mud — up to the bumper!
3 Speed over 100-ft. unbanked circle!
4 Twist over ditches — 18 inches deep!
5 Drive up 6% grade thru 3-ft. of sand!
6 Climb 70% grade from dead stop!
7 Climb 8-in. beam from standstill!
8 Drill pole holes to prove equipment!
9 Speed safely over level highways!
1
2
3
4
5
6
7
8
9



This is FWD's proving ground. This is your assurance that the FWD you select has the stamina to insure long life without expensive mechanical breakdowns.

An FWD climbs a 70% grade on the proving ground. For all the facts, see your FWD distributor — or write FWD direct.

An Invitation To Truck Buyers

We invite you to watch FWDs pass a series of rigid performance tests. Ask your FWD distributor to arrange your visit to our plant. Or — if you can't get away, ask him to show you the movie, *The FWD Story*. In either case, you will see for yourself how FWD trucks can help solve your heavy-duty trucking problems.

Walter C. Allen
President
The Four Wheel Drive Auto Company

THE FOUR WHEEL DRIVE AUTO COMPANY
Clintonville, Wis. • *Canadian Factory:* Kitchener, Ontario
FOUR AND SIX WHEEL DRIVE TRUCKS

America's Foremost Heavy-Duty Truck

Producers
Refiners
Marketers

of petroleum products

Be sure with Pure

THE PURE OIL COMPANY

Marketing Offices in Principal Cities of the Eastern, Central and Southern States
General Offices, Chicago, Illinois

Get the

Yours for the asking is this interesting book on wire rope. Among other things it tells how proper care and servicing cuts rope costs. Get your copy at your Jones & Laughlin Supply store or write us at Tulsa. Ask for "WIRE ROPE IS A MACHINE."

Rope that lasts so much longer

J&L STEEL

Yes, there are reasons. J&L Precisionbilt Wire Ropes last so much longer because they are manufactured to new high standards, under the most exacting metallurgical and fabricating controls. The wires are drawn from very special steel to precise uniformity. You even get plus value in a special lubricant which combats corrosion. Get the benefits of higher speeds with greater safety, and lower ton-mile costs with unqualified approval from the men on the derrick floor. Rig up NOW with J&L Precisionbilt Wire Rope and we'll be content to let your own records sell subsequent installations. Your nearby Jones & Laughlin Supply store has the rope to fit your work and equipment. Let's go!

JONES & LAUGHLIN SUPPLY COMPANY

Subsidiary of Jones & Laughlin Steel Corporation

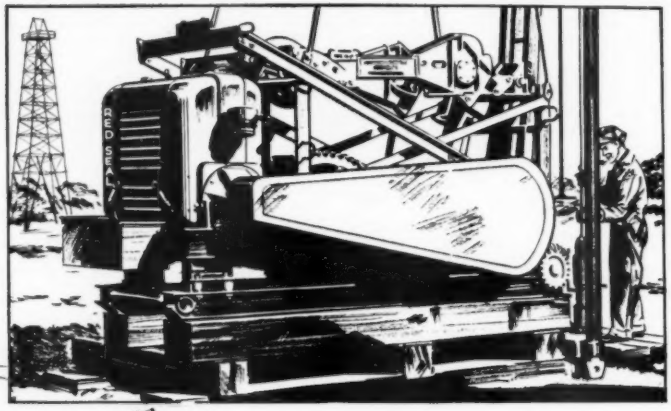
Stores and Offices in 17 States

General Office

TULSA, OKLAHOMA

RED SEAL ENGINES

BUILT FOR THE JOB!



ENGINES

that safeguard your profits

Maintenance costs, which make such a difference in profit, can be kept in line by standardizing on Continental oil field power. Continental Red Seal engines run and keep on running, and they're designed for easiest servicing when service or adjustment is required. Tappets are removable. Bearings are the thin-shell, heavy duty, acid-resistant type. Accessories are easy to get at. For longest running with the least time out, choose the Red Seal that's ***built for the job.***

No Lost Week Ends
WITH RED SEAL POWER

Insure against costly interruptions, with Red Seal oil field power. Extra stamina — extra dependability for oil field jobs — are built in. All Red Seal engines, for instance, feature water by-pass and thermostats to maintain correct temperature for smoothest, most efficient operation, with minimum oil dilution, minimum cylinder bore wear. Write for the name of your nearest Red Seal dealer. Get the ***facts*** about these superior engines.

RED SEAL R-602 ***Here is one of the overhead-valve engines in the Red Seal line. Of completely postwar design, it has power characteristics which adapt it ideally to oil field needs. It delivers up to 120 h.p., intermittent duty, on natural gas. For full details write for engine folder PR47602, or ask your Red Seal dealer.***

Continental Motors Corporation

205 MARKET ST., MUSKEGON, MICH.

P. O. BOX 2309, DALLAS, TEXAS

AXELSON FIRST CHOICE

PETROLEUM PRODUCTION EXECUTIVES AGREE AXELSON pumps, the result of 55 years' experience by the world's largest designer and manufacturer of deep-well plunger pumps, deliver the most efficient and dependable production at all depths, under any well condition, with every type of surface prime mover.

LIFTING COSTS ARE LESS PER BARREL when the crew runs an AXELSON pump ... maximum delivery per stroke with minimum power consumption ... fewer costly pulling jobs ... reduced pump repair and maintenance expense.

FEWER INTERRUPTIONS OF PRODUCTION SCHEDULES occur when AXELSON pumps are working the lease ... interchangeable parts designed for individual bottom-hole conditions ... precision manufacture ... rigid metallurgical and quality control ... AXELSON'S own time-proved alloys.

MAXIMUM PRODUCTION FROM ANY WELL is assured with an AXELSON pump ... custom-assembled to meet individual well characteristics such as gravity, gas volume, heat, water, abrasive and corrosive conditions, length of stroke, pumping speed, and power at the rig.

THE CREWS ON THE LEASE KNOW AXELSON PUMPS ... how they work and why they work better ... This knowledge, by the men who are responsible for maintaining production, pays extra dividends through keeping the fluid column moving more efficiently.

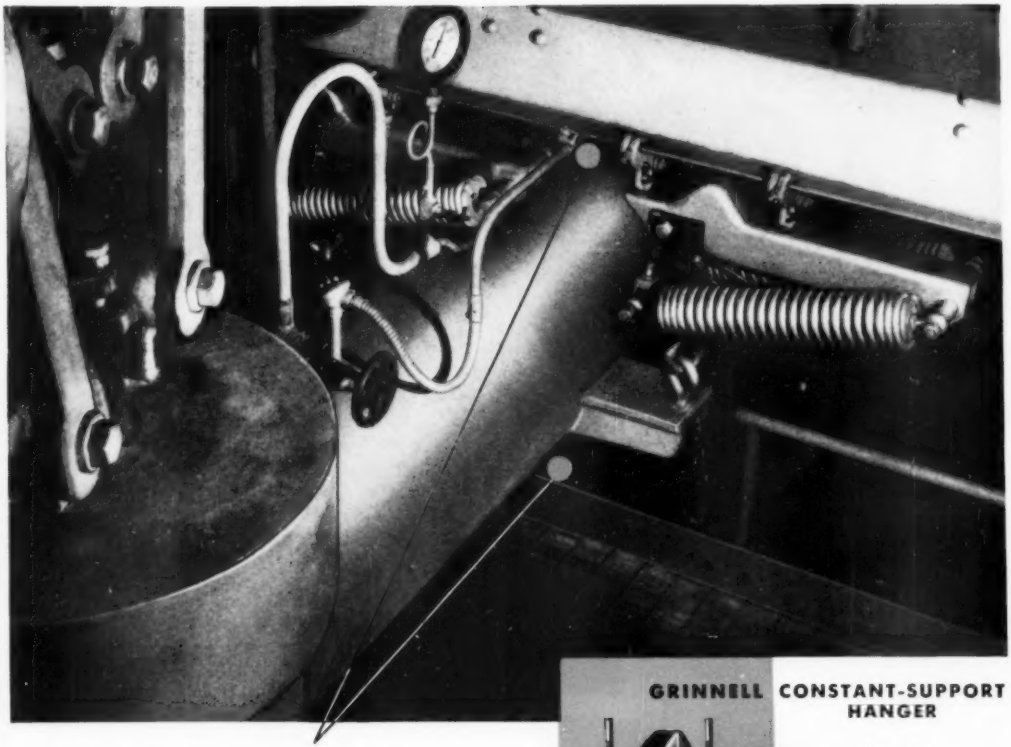
AXELSON FIRST CHOICE *in Sucker Rods – Deep Well Plunger Pumps, Pump Components and Hydraulic Long Stroke Pumping Units*

AXELSON DEEP WELL PLUNGER *Pumps*

PROVED DEPENDABILITY FOR OVER HALF A CENTURY

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON MANUFACTURING CO. • PLANTS – Los Angeles 11; St. Louis 16 • OFFICES – New York City 7; Tulsa 1; Buenos Aires Argentina; Caracas, Venezuela • DISTRIBUTORS – Jones & Laughlin Supply Co.; Great Northern Tool & Supply Co.; C. C. McDermand, Maracaibo, Venezuela; Industrial Agencies, Ltd., San Fernando, Trinidad, B.W.I.; Industrias Waldrip & Campbell, Caracas, Venezuela.



PLAYROOM for a HEAVYWEIGHT

It's a lively chunk of deadweight, this big boiler lead from a superheater outlet at the stop and check valve . . . in the new Southwark station of the Philadelphia Electric Company. It requires "playroom". From its position when cold to its position at 900°F., this piping travels through all three planes — vertical, lateral and longitudinal.

At every point of its travel, the weight of this piping is fully supported by Grinnell Constant-Support Hangers. Yet, because of their compact design, little extra "playroom" need be allowed in which to install the hangers.

Write for the new Grinnell Pipe Hanger Catalog 10-D, containing every pipe hanger, part and accessory, with full instructions for easy selection and correct specification.

GRINNELL CONSTANT-SUPPORT HANGER

the ONLY constant-support pipe hanger

- provides constant support to piping subject to vertical movement — in all "hot" and "cold" positions.
- maintains full safety factor in supporting high temperature, high pressure piping.
- non-resonant and energy absorbing.
- mass-produced from standard precision parts.
- individually calibrated for each installation.
- load-adjustment features incorporated into design.
- three models meet entire range of load-travel specifications.
- minimum headroom required.

99 YEARS PIPING

GRINNELL

Grinnell Company, Inc., Providence, R. I. Branch warehouses: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston Long Beach • Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

FOR *Dependable Delivery*— OF DEPENDABLE GAS STORAGE CAPACITY

[redacted] GAS LIGHT COMPANY
240 MAIN STREET
[redacted]

December 31, 1948

A. E. Harvey
Vice President
Stacey Brothers Gas Construction Company
Cincinnati, Ohio

Dear Mr. Harvey:

It is with considerable personal satisfaction that I write you this letter concerning the [redacted] Foot Holder in our [redacted] Plant. I took considerable kidding from some manufacturers that it would be impossible for you to meet the schedules quoted at the time we signed the contract. That you were able to do so must be equally satisfying to you.

The Holder was in service December 23, 1948 and on December 25, 1948, Christmas day we had an all time peak send-out. This is almost as close timing as we had on the Relief Holder in [redacted].

Your Mr William W. McDaniels, did an outstanding job as you must know he would. Our people were very much impressed with his ability and the results certainly proved this.

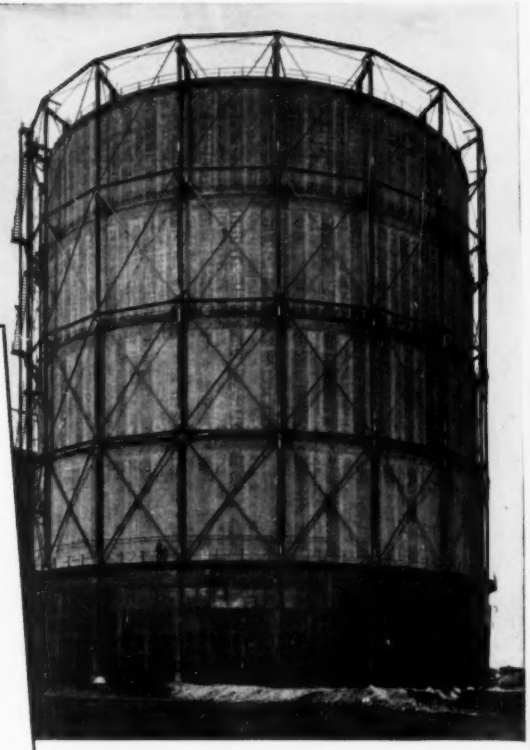
Please pass along to Al Asar our thanks and to you again.

Best regards for the New Year.

Very truly yours,

[redacted]
Vice-President

[redacted]



Another 3,000,000 Cubic Foot STACEY BROTHERS All-Welded Panel Wet-Seal Gus Holder

The letter speaks for itself—an actual, unsolicited testimonial of Stacey Brothers *service.*

Ability to meet contract delivery dates comes only as a result of long years of design, fabrication and erection experience—and we've had more of it than any other supplier.

Since we first introduced our patented All-Welded Panel design, we've built more than 100,000,000 cubic feet of holder capacity—78 holders over 100,000 cubic feet in size, including the world's largest (10,000,000 cubic feet)—and a whole host of smaller ones.

The service you get from a Stacey Brothers holder doesn't stop when the contract erection date has been met—it *starts* then. All-welded construction gives longer life, greater freedom from rust, fewer repairs, lower maintenance costs, less down time. Prove it to yourself by inspecting a Stacey Brothers holder installation—there's one near you. May we give you the name and location?

STACEY BROTHERS GAS CONSTRUCTION CO.
One of the Dresser Industries
5535 VINE STREET • CINCINNATI 16, OHIO

For an interesting illustrated 50-page catalog on Stacey Brothers Patented, All-Welded Panel-Type Holders, write for Bulletin W-45.

Stacey Brothers
ALL-WELDED GAS HOLDERS

Oil field service is a tough test for bearings. Heavy loads, severe shocks, continuous operation, high speeds all take their toll. That's why more Timken tapered roller bearings are used in oil field equipment than any others — and have been for many years.

Timken bearings keep rotating parts turning smoothly, frictionlessly because of their scientific design; precision manufacture; and extremely high finish of contacting surfaces.

They carry maximum loads — radial loads, thrust loads and both together in any combination because of their tapered construction and the line contact of rolls and races.

They last longer because they are made of Timken alloy steel — the finest material ever developed for tapered roller bearings — heat treated and case hardened to provide the greatest possible resistance to stress and wear.

The Timken bearings that go into your equipment today embody 49 years of continuous refinement. There is no substitute for this experience. Look for the trade-mark "TIMKEN" on every bearing.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

THE TIMKEN ROLLER BEARING COMPANY
Canton 6, Ohio - Cable Address "TIMROSCO"

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →✳←

Now on Duty in Alaska

WITH THE U. S. AIR FORCE!

Cessna
190 and 195

YES! After exhaustive AIR FORCE TESTS -- then SPECIAL TESTS by ten "bush pilots" -- the U. S. Air Force ordered fourteen production-line Cessna 195s for rugged Alaskan work! Cessna considers it a great honor to have a standard civilian plane picked to serve with the finest Air Force on earth ...And is also proud that two of these ships are serving the U. S. National Guard!

HIGH WING DESIGN for greater stability. You ride in the shade—enjoy the scenery!

AIRLINE-TYPE ENGINES! A 300 H.P. Jacobs in the 195. A 240 H.P. Continental in the 190.

Room for 4 with lots of luggage ...5 if you're traveling light!

Cruising Speeds—Over 165 m.p.h. Range—over 700 miles.

All-metal construction throughout.

Hamilton Standard Constant Speed Propellers.

SPEED UP OPERATIONS - cut costs - with this modern production and sales tool! These fast, 4-5 place planes enable fewer high salaried engineers, geologists, other "key men" to get more done..."fly the lines" inspect oil fields and terrain, rush needed parts anywhere in the nation. The right size for any average group - they cruise comfortably at 165 m.p.h. -- land easily on short, rough fields -- have every safety and comfort feature . Yet operating and maintenance cost are amazingly low! See them - see your Cessna dealer today!

Cessna 120-140

Roomy, cross-country, 2-place planes ... at light, training plane prices. Cruise at over 100 and 105 m.p.h.

Cessna 170

The famous low-cost, 4-place "Family Car of the Air." Now all-metal. Cruising speed—over 120 m.p.h.

CESSNA LEADS* because Cessna offers "more for the money!"

*In 1948, Cessna sold more personal planes than any other company.

USE THIS COUPON
or See Your Nearest Cessna Dealer

Cessna Aircraft Co., Dept. OG-4, Wichita, Kansas.

Please send free literature giving complete description of the Cessna 170 ( ); Cessna 120, 140 ( ); Cessna 190, 195 ( ); Literature for model builders ( ).

Name.....

Street No.....

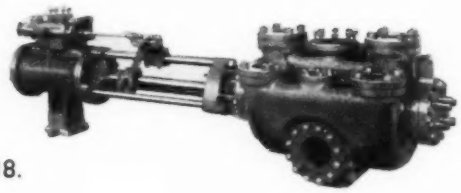
City.....County.....

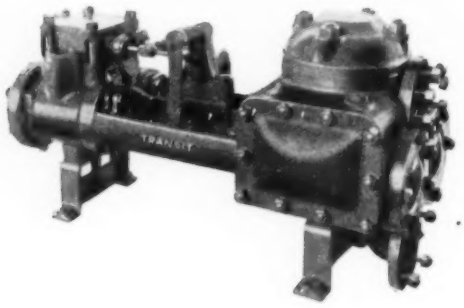
State.....Phone No.....

TRANSIT *Jacketed* *Steam* PUMPS

for keeping Viscous Liquids *liquid*

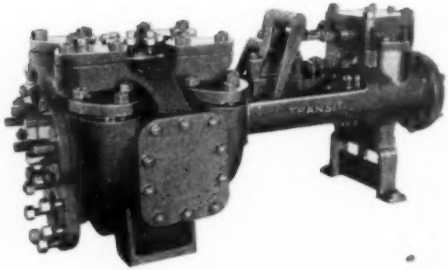
These pumps are built in both Single and Duplex Types. The Single is available in sizes from 4½x4x6 to 28x14x24; the Duplex in sizes from 6x4x6 to 22x10x18.





Transit Single Jacketed Steam Pumps are fully described in Bulletin 2200; Duplex Jacketed Steam Pumps in Bulletin 1100.

Regularly furnished with Cast Iron Liquid Ends for temperatures up to 450° F. For temperatures above 450° F. Cast Steel Liquid Ends are furnished.



NATIONAL TRANSIT PUMP AND MACHINE CO.

Home Office and Works, OIL CITY, PENNA. Mid-Continent Warehouse, 318 East Archer Street, TULSA, OKLA.

NEW YORK · PHILADELPHIA · CHICAGO · CLEVELAND · PITTSBURGH · LOS ANGELES · HOUSTON · TULSA

Allied Supply Company, 2068 East 37th Street, Los Angeles, California

The Lang Company, 267 West First South St., Salt Lake City, Utah

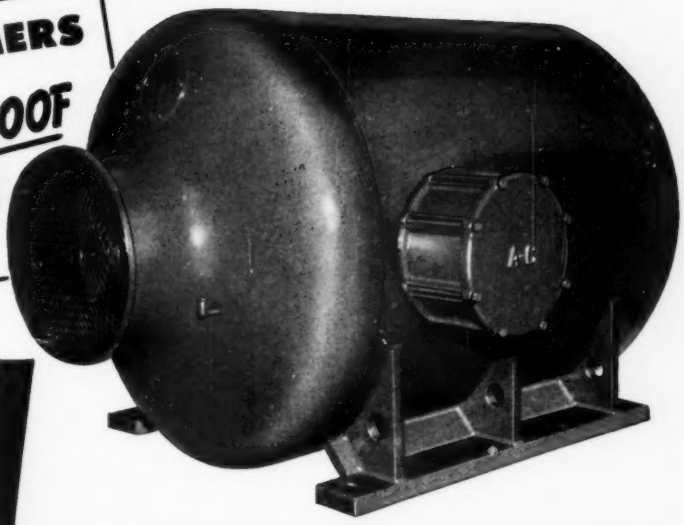
Eugene V. Winter Co., 15 Drumm Street, San Francisco, California

Standard Supply and Hardware Company, 822-838 Tchoupitoulas St., New Orleans, Louisiana

Reeves & Skinner Machinery Co., 2211 Olive Street, St. Louis, Missouri

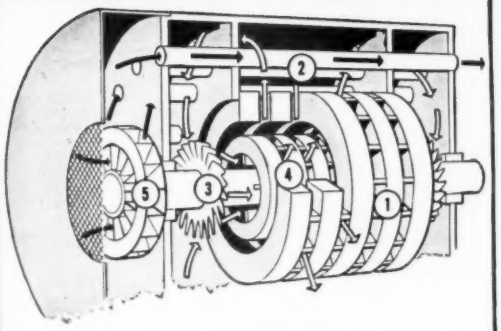
ALLIS-CHALMERS

EXPLOSION-PROOF MOTORS



NEW TUBE-TYPE FAN-COOLED DESIGN

How Tube Cooling Works



Stator core (1) is surrounded by tubes (2). Internal fans (3) circulate air through ducts (4) in rotor and stator and around tubes, transferring heat to tubes. External fan (5) drives outside air through tubes, removing heat and keeping tubes clean. All electrical parts are enclosed. Dirt cannot enter.

- **Heat exchanger is practically self-cleaning**
- **Install anywhere – indoors or out**
- **75 hp and up – for 1-D or 2-G locations**

FOR HAZARDOUS LOCATIONS the design of the tube-type heat exchanger in this Allis-Chalmers explosion-proof motor cuts maintenance costs to a new low. Large heat transfer area plus internal and external forced air circulation removes heat quickly. Cleaning is practically eliminated because the air passages are unrestricted. Air flow through the straight tubes removes foreign matter.

Three years of operation in the field have shown that savings in maintenance can be made with this cooling arrangement. Sizes from 75 to 600 hp carry Underwriter's label. Larger sizes available. Also TEFC* designs for non-hazardous locations. For complete information, outline your requirements to your A-C Sales Office, or write for Bulletins 05B7150 and 51R7149.

*Totally-Enclosed Fan Cooled

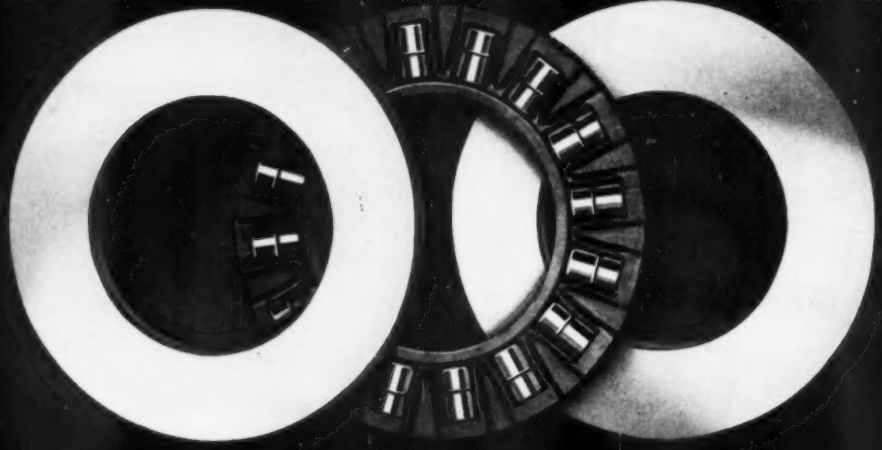
A-2609

ALLIS-CHALMERS, 1059A SO. 70 ST.
MILWAUKEE, WIS.

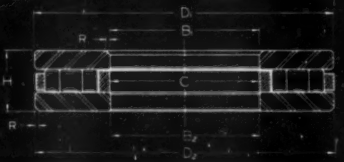
A-C ALLIS-CHALMERS

ALLIS-CHALMERS

KAYDON TYPE RT THRUST ROLLER BEARINGS



STRAIGHT ROLLER TYPE
FLAT RACES
TYPE RT



SIZES AS LISTED
CARRIED
IN STOCK

Bearing No.	Sizes and Dimensions • See Drawing Above						Roller Diam.	R 45° Chamfer	Lbs. †Capacity at 100 R.P.M.
	B_1	B_2	C	D_1	D_2	H			
RT-26	2.002"	2.015"	2.010"	5.968"	6.000"	1.375"	½"	.062"	36,000
RT-27	2.002	2.015	2.010	6.968	7.000	1.375	½	.062	48,300
RT-28	2.002	2.015	2.010	7.968	8.000	1.375	½	.062	65,400
RT-36	3.002	3.015	3.010	5.968	6.000	1.375	½	.062	29,800
RT-37	3.002	3.015	3.010	6.968	7.000	1.375	½	.062	43,600
RT-38	3.002	3.015	3.010	7.968	8.000	1.375	½	.062	55,600
RT-39	3.002	3.015	3.010	8.968	9.000	1.375	½	.062	67,500
RT-47	4.002	4.015	4.010	6.968	7.000	1.750	⅝	.062	34,700
RT-48	4.002	4.015	4.010	7.968	8.000	1.750	⅝	.062	54,800
RT-49	4.002	4.015	4.010	8.968	9.000	1.750	⅝	.062	69,400
RT-410	4.002	4.015	4.010	9.968	10.000	1.750	⅝	.062	89,300
RT-58	5.002	5.015	5.010	7.968	8.000	1.750	⅝	.062	40,300
RT-59	5.002	5.015	5.010	8.968	9.000	1.750	⅝	.062	63,300
RT-510	5.002	5.015	5.010	9.968	10.000	2.000	¾	.125	83,300
RT-511	5.002	5.015	5.010	10.968	11.000	2.000	¾	.125	111,600
RT-512	5.002	5.015	5.010	11.968	12.000	2.000	¾	.125	136,300
RT-69	6.002	6.015	6.010	8.968	9.000	2.000	¾	.125	48,300
RT-610	6.002	6.015	6.010	9.968	10.000	2.000	¾	.125	76,000
RT-611	6.002	6.015	6.010	10.968	11.000	2.000	¾	.125	100,100
RT-612	6.002	6.015	6.010	11.968	12.000	2.000	¾	.125	124,300
RT-710	7.002	7.015	7.010	9.968	10.000	2.000	¾	.125	62,400
RT-711	7.002	7.015	7.010	10.968	11.000	2.000	¾	.125	85,800
RT-712	7.002	7.015	7.010	11.968	12.000	2.000	¾	.125	109,200

ABOVE SIZES IN STOCK FOR IMMEDIATE SHIPMENT

KAYDON *Types of Standard or Special Bearings:*

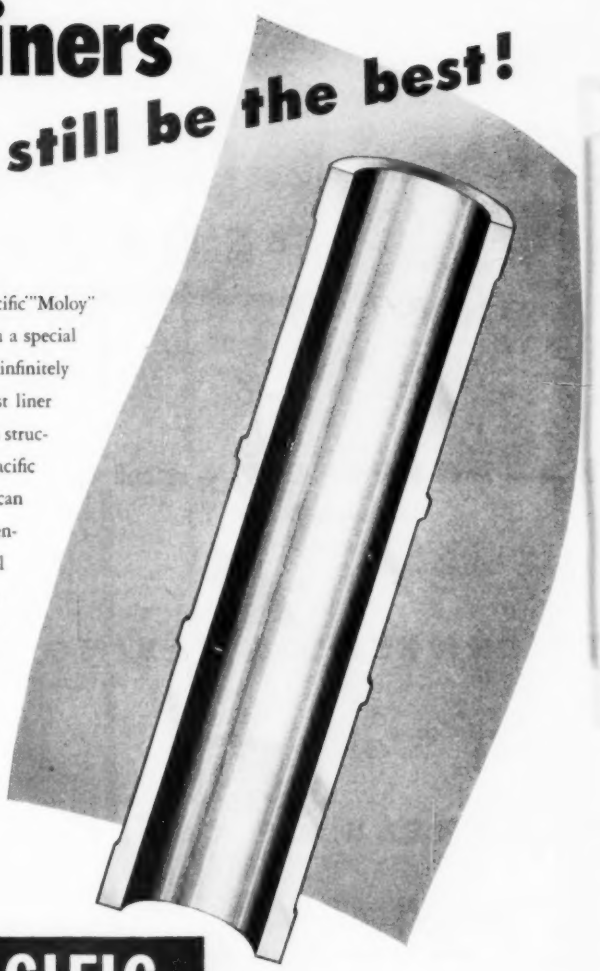
Spherical Roller • Taper Roller • Ball Radial
Ball Thrust • Roller Radial • Roller Thrust

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

All types of Ball and Roller Bearings 4" bore to 120" outside diameter

by any other name...

pacific "moloy" liners would still be the best!



Call them what you will... the superiority of Pacific "Moloy" Liners is unequaled. Only Pacific gives you a special "Moloy" molybdenum-alloy liner with infinitely greater resistance to wear... an electrical cast liner of especially high quality and uniform grain structure. Superior machining and materials for Pacific "Moloy" Liners cost us 30% more but you can buy them for the price of a conventional centrifugal cast liner. Pacific revolutionized the oil plunger pump industry more than 17 years ago with the introduction of Pacific "Moloy" Liners. Today the new Pacific "Moloy" Liners are vastly improved through constant research and field testing... today only Pacific "Moloy" Liners will give you the service and economy you demand.

25th Anniversary

Pacific Pumps inc.
ONE OF THE DRESSER INDUSTRIES

PACIFIC
Precision Built
PUMPS

HUNTINGTON PARK, CALIF.
Mid-Continent Division:
1221 E. 1st St., Tulsa, Okla.
Export Office:
Chanin Bldg., 122 E. 42nd St., New York
Offices in All Principal Cities

DW-2

FOR YOUR TOUGH PERFORATING JOBS

KONESHOT PERFORATING

Ask

HARDNESS OF CASING

the

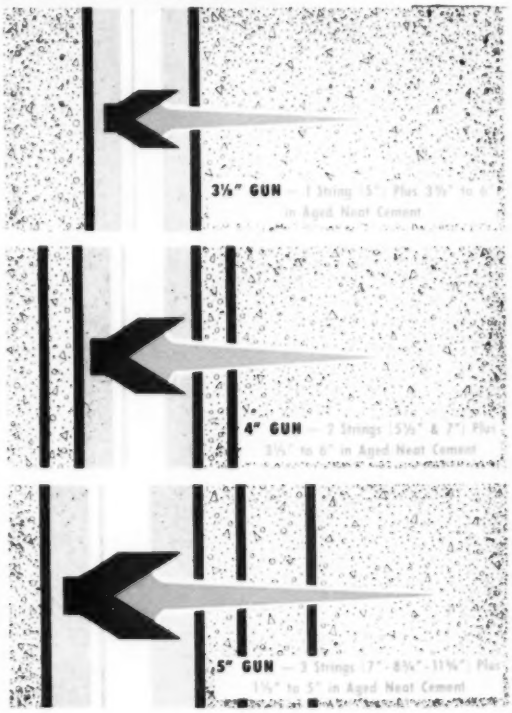
THICKNESS OF CASING

Lane-Wells

THICKNESS OF CEMENT

Man!

DO NOT AFFECT PENETRATION

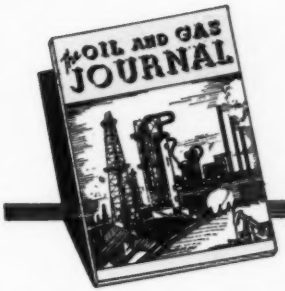


LANE WELLS

LOS ANGELES — HOUSTON — OKLAHOMA CITY

GENERAL OFFICES, EXPORT OFFICES & PLANT 5610 SO. SOTO ST., LOS ANGELES 11, CALIFORNIA

LANE-WELLS SERVICE AND PRODUCTS ARE AVAILABLE THRU PETRO-TECH SERVICE CO. IN VENEZUELA



Published every Thursday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Okla.

P. C. LAUINGER
President

S. H. ROURKE
Business Manager

HANSON B. PIGMAN
Circulation Manager

ADVERTISING

MITCHELL TUCKER
Manager

Houston Office
Sterling Building, Phone Charter 4-4626
WAYNE RIVES
Vice President, Gulf Coast Sales
JOHN M. SPEARS
Representative

New York Office
415 Lexington Ave., Phone Murray Hill 2-4731
CHARLES A. WARDLEY
Eastern Manager
ROBERT N. CAIRD, JR.
Representative

Chicago Office
103 West Madison, Phone Central 6-2537
C. R. FARMER
Manager
E. S. KLAPPENBACH
Representative

Pittsburgh Office
429 Fourth Ave., Phone Atlantic 4835
ALFRED M. JONES
Representative

Tulsa Office
211 S. Cheyenne, Phone 3-6291
JOHN D. REILLY
Mid-Continent Manager
J. PARKER HOLLAND
Production Manager

Los Angeles Office
650 S. Grand Ave., Phone Vandike 0722
DONALD O. HANSON
Manager

England Office
111 Thorley Lane, Timperley, Cheshire
HARRY S. BECKER
European Representative

Member
Audit Bureau of Circulations
Associated Business Papers

JOURNALLY Speaking

New Figures

WITH this issue we introduce a new feature we are sure you are going to like—a lot of new figures about current operations in the oil industry.

Turn to pages 170-73 and see for yourself.

All our former statistics are there in a new dress, and there are many more which you are certain to find useful if you really want to know what's going on in the industry at the moment—and who doesn't?

This bigger and better statistical section contains all the weekly figures of importance we could lay our hands on. Also, several series of regular monthly reports will be rotated in appropriate spaces as they become available.

In these four pages, we believe, you will find assembled all the current data telling what has been happening in the oil industry in recent weeks, where it stands today, and what the indicated trends are for the near future—all condensed and presented in tables and charts. There's a lot of very vital information packed into these four pages, and it's particularly worth study now when trends are a bit less certain than they were a year or two ago.

This expanded statistical feature is just part of our regular service. No extra charge.

Smart Gals

THE girls who work for oil and supply companies in New Orleans are demonstrating that Dixie belles are ambitious as well as charming.

A group of secretaries from 12 companies formed the Desk and Derrick Club for purposes of sociability, but they discovered that it helped a lot in their work to be acquainted with the people they were telephoning every day on behalf of their bosses. This worked so well that they decided it would help even more if they learned a little something about what they were taking dictation on, so they are now working up a series of lectures and study classes on various phases of the oil industry.

It didn't take the bosses very long to see the value of this sort of grass-roots employe-relations program, and the gals are getting plenty of encouragement. It's an idea that needn't necessarily be confined to New Orleans.

But Coffee's O.K.

THIS is "World Trade Week," an occasion not notably celebrated by domestic producers worried over foreign oil.

As though to rub it in, Secretary of Commerce Sawyer called on all citizens to ponder the benefits of imports, saying: "When we drink coffee . . . or drive our cars to work, we are using products that depend entirely or in large part upon the goods we buy from other countries." He probably had in mind rubber, tin, and chrome, but the independent producers doubtless will interpret it as more Washington propaganda about the insufficiency of domestic petroleum.

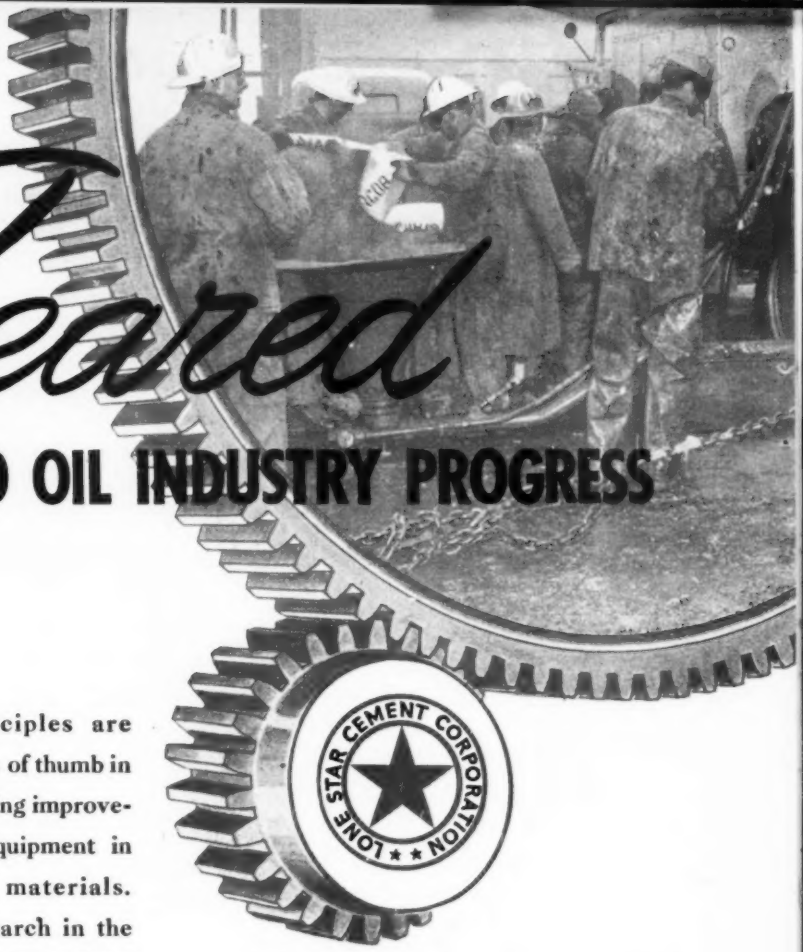
Aesop Brown

RUSSELL BROWN, whose job as general counsel of the Independent Petroleum Association of America seems to consist, at the moment, chiefly of sounding the tocsin against the threat of foreign oil, professes no enmity toward the large importing companies but says they won't be able to resist various pressures to import unless Congress makes a law against it. He says the present condition of good will between the importers and the domestic producers is like the mule and the rooster quartered in the same stall who made an agreement not to step on each other.

Who's a Back Number?

LETTER came in the other day addressed to the Journal's "Back Number Department." It wound up in what we much prefer to call the "Readers' Service Department," which occasionally can fill a request for a copy of a former issue, but which much resented the insinuation in the address on that letter.

—Henry D. Ralph



Geared TO OIL INDUSTRY PROGRESS

ENGINEERING principles are steadily replacing rule of thumb in oil field operations. Resulting improvements in methods and equipment in turn demand improved materials. Through continuing research in the laboratory and in the field, LONE STAR Cements are geared to Oil Industry progress, as demonstrated by outstanding field performance. Select the LONE STAR Cement that fits your job.

LONE STAR CEMENT CORPORATION

Offices: DALLAS • HOUSTON • NEW ORLEANS • KANSAS CITY, MO. BIRMINGHAM • JACKSON, MISS. • INDIANAPOLIS • BOSTON ALBANY, N. Y. • BETHLEHEM, PA. • CHICAGO • NORFOLK PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C. • NEW YORK

The OIL AND GAS JOURNAL

FOUNDED IN 1910 BY PATRICK C. BOYLE

VOL. 48, NO. 3 MAY 26, 1949

EDITORIAL STAFF

C. O. WILLSON
Editor

Kenneth B. Barnes	Engineering Editor
Henry D. Ralph	News Editor
George H. Weber	Refining Editor
415 Lexington Avenue, New York City	
Paul Reed	Pipe Line Editor
W. L. Nelson	Technical Editor
Lynn M. Nichols	Associate Editor
Neil Williams	Associate Editor
Charles J. Deegan	Associate Editor
R. B. Tuttle	Associate Editor
C. Dudley Johnston	Staff Artist

DISTRICT EDITORS

Dahl M. Duff	415 Lexington, New York City
Roy F. Carlson	211 S. Cheyenne, Tulsa
John C. Casper	211 S. Cheyenne, Tulsa
Robert Harwick	650 S. Grand, Los Angeles
Carl F. Hoot	Mercantile Bank Bldg., Dallas
Victor Lauriston	35 Stanley Ave., Chatham, Ont.
Bertram F. Linz	621 Albee Bldg., Washington
Leigh S. McCaslin	Sterling Bldg., Houston
John C. Reidel	211 S. Cheyenne, Tulsa
William P. Sterne	211 S. Cheyenne, Tulsa
D. H. Stormont	Mercantile Bank Bldg., Dallas

EDITORIAL ASSISTANTS

Polly DeArmond	211 S. Cheyenne, Tulsa
Essie Mae Abbott	Sterling Bldg., Houston

CORRESPONDENTS AT

Denver, Colo.	Calgary, Alta.
Pittsburgh, Pa.	Ashland, Ky.
Columbus, Ohio	Oil City, Pa.
Mount Pleasant, Mich.	

Subscription rate to the petroleum industry, United States and foreign, 1 year, $3.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1949 by The Petroleum Publishing Co.

In This Issue

News

Apparent Demand Drop Does Not Represent Actual Consumption 54
A.A.O.D.C. Hears New Ideas on Greater Safety, Efficiency 55
FPC Splits Again, Writes Two Reports on Kerr-Thomas Bill 56
Dutra Visit May Result in Future Oil Deals 56
Last Major Controls on Exports Removed 56
5,450 Miles of Crude, Product Lines Now Under Construction 58
Tidelands Compromise Given Impetus by O'Mahoney Views 60
Yantis Field Is Picked for Oil-Waste Study 60
Sinclair Petroleum Spuds First Well Ever Drilled in Ethiopia 157
Creole Position Strong Despite Budget Cut 157
Drilling Activity to Be Stepped Up in Mexico's Reynosa Field 158
Major Decline in World Crude Production Effected in March 160
Immediate Speedup in Tapline Work Planned 162
Texas Allowable Cut 32,285 Bbl. in Sixth Consecutive Reduction 163
ASPB Change Effected; Board Told to Prepare Emergency Plans 166
Scouts, Landmen Will Hold Houston Meeting 166
More Petroleum to Be Used by Gas Utilities in the Future 167
Thomas to Seek Reenactment of Oil-Import Quota Provision 168
Brown Says Imports Rise, Asks Action 168

Engineering-Operating

Shell Completes $50,000,000 Petrochemical Plant Expansion 64
Slaughter Gasoline Plant—Outstanding Example of Cooperation 68
Hydraulic Fracturing of Oil, Gas Formations by Hydrafrac Process 75
Use of Cable Tools in Wet Holes and at High Stroke Rates 87
Questions on Technology 93
New Package and Grease Plant Opened on West Coast 95
Combination Lube-Oil Plant 98
Selecting Wire Lines for Cable-Tool Drilling 102
Sun Completes Base for Geophysical Operations 105
Electrodrill Recovers Representative Cores 106
Book Reviews 111
Engineering Fundamentals—Oil Displacement by Gas and Water 113
Cost-imating—Electrical Equipment 115
Oil and Gas Equipment Digest 117

Exploration-Development

Rocky Mountain Exploration Notes 139
Highlights of Week's Developments 139
Reports by Areas Start on Page 140
April Completions Gain 4.3 Per cent Over Same Month Last Year 155

Departments

Journally Speaking 49
Editorial 53
This Week 57
Personals 61
Deaths in the Industry 63
Pipe-Line News 123
Refining News 129
Natural-Gas News 132
Drilling Contractors 135
Running High 136
International News 157
Watching Washington 165
Exploration Statistics 170
Production Statistics 171
Refining Statistics 172
Market Statistics 173
Equipment Men in News 174
Classified Advertising 176
Calendar of Events 180
Advertisers' Index 180

You're right...

to want the best equipment for testing, acidizing, plasticizing, squeeze cementing —all of which are vital operations in well completion.

That's why you should use the Baker Model "RT-8" Retrievable Cementer, to provide a safe, positive device for...

- ***testing casing, or locating holes in pipe;***
- ***placing cement, plastic, acid, or any other fluid, at any necessary pressure, behind the casing or liner through perforations, or in open hole below the shoe;***
- ***setting in lime formations for acidizing or squeeze cementing;***
- ***pressure testing the effectiveness of a previously performed cement job.***

The Baker Model "RT-8" Retrievable Cementer (Product No. 411RT) is operated mechanically and is not dependent upon fluid pressure to set or release. It functions successfully in high-pressure wells, and will withstand with ample safety any pressure that may be imposed upon the well casing. It operates with equal efficiency and safety in low-pressure or low fluid level wells.

In addition to the obvious advantages of a "Retrievable" tool the Baker Model "RT-8" Retrievable Cementer has these outstanding features:

RUNS IN FAST—From 1 to 4 hours time is saved over the time required to run in a cementer equipped with swab cups;

RUNNING-IN STRING WILL NOT FLOW OVER while a Baker Cementer is being run-in hole at reasonable speed;

PERMITS CIRCULATING THE LONG WAY;

FUNCTIONS EFFICIENTLY IN LOW FLUID LEVEL WELLS as well as in high pressure wells;

PERMITS TESTING CASING, or protecting casing during squeeze job, by applying reasonable pressure to the annulus after cementer is set;

WITHSTANDS ANY PRESSURE below the cementer that is safe for the well equipment;

MAY BE ROTATED OUT OF THE HOLE—When the cementer is ready to be retrieved from the hole, rotation to the right will lock the slips in retracted position, thus preventing setting while coming out of the hole;

CIRCULATION POSSIBLE IF PACKING UNIT STICKS by means of a Circulation Joint above the cementer;

RELEASES IN EMERGENCY—Contains safety thread for quick release.

You can depend upon the Baker Model "RT-8" Retrievable Cementer

BAKER OIL TOOLS, INC.
Houston • Los Angeles • New York

It's the Best

THE OIL AND GAS JOURNAL

Works Both Ways

THE action at scattered points of several independent refiners in reducing the posted prices for crude oil has raised the question as to whether their action was justified, and whether the reductions have general significance. Comparable reductions confined to low-gravity crudes in some fields have been made by major buyers. A few observers, critical of the reductions, are insisting that the latest developments are evidence that the independent manufacturers of petroleum products have no proper place in the present scheme of petroleum operations.

As an integral part of the petroleum economy it is sufficient here to define the independent refiner as one who depends entirely or substantially on refinery realization for profit, having no important contributions to revenue from any of the other divisions of petroleum operations. In numbers they own about half of the 375 active domestic refineries, but account for less than 25 per cent of the crude runs to stills.

As to the current position of this large group of refiners, the record is quite clear. The W.P.R.A. investigation showed that an operating profit among representative small and medium-sized Mid-Continent refineries is nonexistent at this time. Similar reports come from other areas.

As to the general significance of the refined-market trends which brought about a lowering of crude schedules, the reduced earnings for the first quarter of representative integrated companies are apropos. Other operating divisions as well as refining determine the gross and net incomes of these large operators.

It is incorrect to assume that independent refiners, since they are buyers and not producers, take advantage of every opportunity to reduce crude-price schedules. They know that their most profitable operations have come during periods of relatively high prices for crude oil provided tight markets prevail. But surpluses of crude oil are always reflected in excess products.

Producers acting independently and the state conservation bodies are endeavoring to reduce crude output to needs. There are indications of improvement in the crude-oil supply-demand balance, but this improvement has yet to solve the immediate price problems of refiners.

Regarding the long-range need for independent refiners, we would place their position beside that of all the other independent groups—essential parts of a competitive industry. They are entitled to returns on operations covering plant costs plus profit, which is in fact a basic requirement in the maintenance of a healthy industry regardless of whether the refinery is independently owned or is part of a large integrated operation.

It is true that the independent refiner's prices have always quickly reflected any unfavorable shifts in the oil industry's activities. But criticism should also take into consideration that this quick reaction works both ways, with the independent refiner always taking the lead in advancing markets.

Apparent Demand Drop Does Not Represent Actual Consumption

by John C. Casper

THE current drop in the apparent demand for petroleum products which has much of the industry badly worried at the moment is largely an unreal figure reached by comparison of two abnormal situations.

The drop is a comparison of the volume of products moving out of refinery and bulk storage now as against the same period a year ago. For example, the figures for a 5-week period ending May 14 compared with the corresponding weeks of 1948 shows that gasoline demand is up 6.8 per cent, kerosine demand is down 15.1 per cent, distillate demand is down 14.4 per cent, and residual fuel demand is down 10.2 per cent, or a decline of 2.5 per cent in the demand for the four major petroleum products.

It is highly fallacious to base the outlook for the year on such a comparison because figures both years are far from realities.

Reflect Storage Changes

The prime fallacy is to consider these figures as consumption. They are not consumption at all, but indicated demand as shown by movements out of refiners' storage. In between refinery shipments and actual consumption there is the factor of storage tanks of jobbers, distributors and individual consumers. This factor does not show up in any industry statistics. It is pretty much of an unknown quantity, but some approximations can be made, particularly with regard to middle distillates.

In the spring of 1948 consumers had just squeezed through a very tough winter, all oils were on a hand-to-mouth basis, and the oil-shortage scare was still rampant. So consumers and distributors kept on buying every gallon they could get and store away. This made the apparent demand figures look very high for months after the actual consumption declined because of spring and summer weather.

Therefore the 1948 "demand" figures now used in comparisons were ficticious, unreal, and misleading. In a normal year only about 15-20 per cent of the year's consumption of heating oil moves into distributor and consumer storage during the 4 months of May, June, July, and August, but last year the percentage was much higher.

One industry economist estimates that dealers' stocks of heating oil in the spring of 1948 increased at a rate 3.4 times the buildup during the same period of 1947. Another set of figures indicates that last spring dealers and consumers were building up stocks of distillate oils at the rate of 250,000 bbl. per day—decidedly an abnormal condition.

This year also is abnormal and contraseasonal, but in the opposite direction. By early 1949 two things became evident to everybody: the winter was much warmer than normal in the section of the country depending most on fuel oil for heating; and the oil industry was in position to supply any needed quantities of fuel oil in any locality.

So consumers and dealers alike stopped their mad rush to keep their tanks full. Warm weather during the first quarter of 1949 caused a loss in demand estimated between 100,000 and 200,000 bbl. per day. During the most recent 4-week period it is estimated that movements to consumers' and distributors' storage has been 200,000 bbl. per day less than during the same period a year ago.

At the present time probably not more than 50,000 bbl. per day of heating oil is moving into consumers' and dealers' storage, whereas this movement should be at least 150,000 bbl. per day if 1949 movements followed the normal pattern. Therefore the refinery demand now is distorted by about 100,000 bbl. per day whereas the figure for 1948 which is used for comparison was about 100,000 bbl. per day above normal.

Must Fill Storage

This situation cannot continue long. Some time between now and the first frost consumers and dealers are going to fill up their empty storage. There are now slightly more than 4,000,000 domestic oil burners installed, and home storage probably averages about 10 bbl. per burner. This is a total storage capacity, not counting that of dealers, of 40,000,000 bbl. On the assumption that it is half full now there is an inescapable demand for 20,000,000 bbl. during the next few months.

During this abnormal condition, refinery demand has been depressed artificially, the production of crude oil has necessarily been cut back more or less in proportion. But when point-of-use storage begins climbing again refinery runs must increase and the supply or available crude will have to rise to take care of this and to meet the normal increase in overall demand for petroleum products.

Estimates of new oil burners to be installed this year vary from 300,000 to 400,000, which will mean an increase of 7.5 to 10 per cent in the number in use over last winter and a corresponding increase in actual consumption of heating oil if next winter is no colder than last. If next winter has normal temperatures there will be a further big increase in consumption, and a really cold winter will bring a whopping increase.

In addition the industry must count on steady increases in consumption of middle distillates for diesel locomotives, stationary engines, farm tractors, construction work, marine uses, tobacco curing, and miscellaneous uses.

Gasoline Outlook Good

The outlook for gasoline is even better. During the 12 months ending with the first quarter of this year domestic sales of motor vehicles were 12 per cent greater than during the preceding 12 months. Even allowing for a higher rate of scrapping, the number of vehicles in operation this summer should be around 10 per cent greater than last summer, and as yet there is no statistical evidence that consumption per vehicle is any less.

Residual fuel oil, it must be admitted, does not present such a rosy picture. Large chunks of the market for railroad and marine use probably will not be regained. However, price declines in recent months have now made resid competitive with coal for utility and industrial uses. If potential consumers decide that residual fuel oil will remain competitive with coal it is highly probable that the resulting switch to heavy fuel oil will bring sizable increases in the demand for this product.

This analysis is not meant to suggest that the oil industry will again be faced with such large jumps in demand as it had during and immediately after the war. It will settle back to a series of steady but more normal annual gains in actual demand. The point is that current figures on movement out of refiners' bulk storage, though commonly spoken of as demand or indicated demand, are not consumption figures and do not indicate the real trend of demand. This should be apparent by fall when the condition of consumers' and dealers' storage returns to something like normal.

Superior Cements World's Longest String of Casing

The world's longest string of casing was run in the hole last week at Superior Oil Co.'s 1 Unit, the world's deepest well, in Sublette County, Wyoming.

Superior cemented 7-in. casing at 19,765 ft., total depth, and prepared to deepen the well. About 400 days have been required to reach the present depth. The well is being drilled as a tight hole.

A.A.O.D.C. Hears New Ideas on Greater Safety, Efficiency

by D. H. Stormont

DALLAS. — Developments in oil-well drilling equipment and practices which make for fewer accidents and greater efficiency of personnel were brought to the attention of the drilling industry here May 24 and 25.

The occasion was the annual accident-prevention clinic of the American Association of Oilwell Drilling Contractors.

Subjects covered ranged from how to break in a new employe and how to use color safety codes, to better methods of taking drill-stem tests and heating drilling rigs. Extensive use was made of films to bring out safe working practices. In an open forum, tool pushers and drilling superintendents from eight oil or drilling-contractor companies freely discussed accident prevention work at rigs under their supervision.

In the opening session on Tuesday morning, J. S. Morris of Allen & Morris, San Antonio, and president of the A.A.O.D.C. gave the welcoming address. He was followed by J. Doyle Settle, association secretary, who outlined the 1949 program of accident-prevention work. Dorris Ballew, Natchez, Miss., chairman of the insurance and safety committee, presided at the opening session while G. W. Hutcheson of George P. Livermore, Inc., Lubbock, had charge of the afternoon session. For the two Wednesday sessions R. L. Parker, Drilling Co., Tulsa, and S. E. Pratz, Jr., of Heldt Brothers Trucks, Alice, Tex., were scheduled to preside.

Cites Accident Causes

Ben H. Mitchell, secretary of Texas Employers' Insurance Association, Dallas, in his address Tuesday brought out that most drilling accidents result from a crewman being struck by an object or piece of equipment. Of the 8,106 accidents analyzed, 2,427 were in this classification. They ranked fourth in relative cost per accident, however, averaging $184 each.

"Handling objects" was the next most frequent type of accident (1,978) with "hand tools" (1,000) and "falling persons" (866) ranking next in order. Accidents involving vehicles accounted for only 0.5 per cent of the total number studied, but ranked first in cost per accident, averaging $590.

Warning and automatic cut-off systems designed to prevent traveling blocks from running into the crown-block were described by Roy Dishman of Penrod Drilling Co., Shreveport. He discussed various devices used either to reduce impact shock between the traveling and crown blocks, or to prevent the traveling block from over-running its limit. These included bumpers, extensions to the top of the derrick as safety space, limit switches such as are used on elevators, and electric eyes.

Inspection Necessary

As a word of caution, he said that regardless of how simple or how reliable these devices may be, they should be periodically inspected and maintained. "There is hardly anything more hazardous than a safety device which does not work at the time," he added. Also in the Tuesday afternoon session, R. G. Benson of the National Safety Council, Chicago, spoke on new developments in accident-prevention training and new protective equipment applicable to the drilling industry. The conference on accident-prevention work and a color movie on hazards involved in operating a cathead completed the session.

C. W. Yance of Rowan Drilling Co., Fort Worth, described the training program followed by Rowan in breaking in a new employe. As described by Yance, the first step is to screen prospective crewmen and then have them examined physically. They then are put through a 28-day training program during which they act as extra members of the day-tour crew.

During this period a new man first helps one of the floormen in his regular duties, and then is assigned to the other floorman. Following this training, he learns the duties of the derrickman and motorman. If he proves himself adept he replaces any member of the crew for a short time as the driller elects. By the time the training program is over, Yance said that the average trainee has a working knowledge of the general duties of all crew members and is more suited to becoming a regular member than a new man would be.

Thirty new and revised safety rules recommended by the association's drill-stem test committee were discussed by F. C. Cooper of Sohio Petroleum Co., Oklahoma City, in his paper, "Safety in Taking Drill-Stem Tests." These rules will be expanded, he said, to include safe practices with respect to magnitos, starters, and ignition systems.

Various types of rig-heating units were described by H. T. Markee, of Phillips Petroleum Co., Bartlesville, in his address Wednsday morning. Despite efforts devoted toward developing a universally applicable rig-heating unit, embodying the necessary safety features, there is not one yet available, he stated.

"Color Code as a Basis Factor in Accident Prevention on Drilling Rigs," was given by Fred Claiborne, of Stanolind Oil & Gas Co., Tulsa, on Wednesday morning.

In the concluding session on Wednesday afternoon problems involving safety in oil-field trucking were brought out. W. W. Duncan of Loffland Brothers, Tulsa; J. S. Jackson of Danciger Oil & Refining Co., Baton Rouge; and V. V. Bruce, safety director for J. C. Hawkins of Dallas, were coauthors of "Accident Problems Confronting Drilling Contractors Doing Oil-Field Hauling." Problems presented in this address were to be analyzed, and remedies suggested, by Russell Fitzpatrick of Texas A. & M. College, and C. T. Stamp of Oil Field Haulers Association, Inc., Austin. A color film showing high points of Stanolind Oil & Gas Co.'s safe-driving training course also was scheduled.

"Point 4" Program to Be Presented Congress

WASHINGTON.—A program of technical cooperation designed to carry out Point 4 of President Truman's "bold new program" is being developed by the State Department for presentation to Congress before the end of the session.

This program, under which a large part of the $125,000,000 to $200,000,000 estimated cost would go to develop Latin American areas, reportedly would include assistance in the exploitation of mineral resources, possibly including oil.

A supplementary program to promote the flow of international investment also may be offered by the department, but officials said it is too early to discuss the nature of such measures.

The program would be under the auspices of the United Nations, with the United States putting up about half of the fund, with other contributions from the United Nations and the countries that would be helped.

The definite plan of operation now is being worked out in the government agencies, but will not be finally approved for submission to Congress until after negotiations with the countries wishing to participate. So far, neither the United Nations nor the specialized agencies have yet formally approved the programs which they would be prepared to undertake in the field of technical cooperation.

FPC Splits Again, Writes Two Reports on Kerr-Thomas Bill

WASHINGTON.—The Federal Power Commission last week explained its split on the desirability of amending the Natural Gas Act to exempt independent producers and gatherers from FPC control, sending majority and minority reports to the Senate interstate commerce committee, now studying the Kerr-Thomas bill.

The majority, opposed to the legislation, consists of Commissioners Thomas C. Buchanan, Claude L. Draper, and Leland Olds. They requested that Olds be given an opportunity to testify before the committee during its hearings, which opened May 17. The minority — Commissioner Harrington Wimberly and Chairman Nelson Lee Smith—expressed the view that Congress never intended to assert jurisdiction over independent producers and gatherers, but they did not ask to be heard.

Misrepresented, Majority Say

Complaining that their position has been the subject of "much misrepresentation," the majority declared that FPC jurisdiction does not extend to the production of oil.

"The commission has not as yet had a case in which it has been necessary to determine the cost of producing gas, where gas is produced with oil," it was explained. "But, should such a case arise, it would be necessary to make a complete assignment of all the operating costs and fixed charges to gas and oil on some fair and equitable basis. It is unthinkable that the commission would charge the full production cost to the oil end of the business, charging the gas operations with only incremental costs, or would credit to the gas operations any profits derived from the production of oil."

Also, the committee was told, the majority feel that no occasion would ever arise to regulate the small producers, for they do not control sufficient supplies of gas to place them in a position to affect materially the interstate movement or prices of natural gas.

Further, it was emphasized, the majority have no desire to impose FPC accounting requirements "on oil companies or companies which are purely producers or gatherers of natural gas," and by a classification of companies the commission can excuse producers and gatherers from complying with those requirements.

The gist of the majority's opposition to the legislation was that it would in one way or another restore interfuel competition in place of the regulatory principle of reasonable rates as the final determinant of the rates at which natural gas would be sold to ultimate consumers. As a result, the consumers' gas bills would be increased by millions of dollars.

"The proposed amendments forebode a change of the situation which would afford dominant producers of natural gas an opportunity to increase prices practically at will, subject only to the ceilings imposed by prices of other fuels," it was contended. "We do not believe this would be in the public interest."

Last Major Controls On Exports Removed

WASHINGTON.—The Office of International Trade last week removed the last of the major export restrictions which have affected the oil industry since the end of the war.

The OIT announced May 19 that, effective immediately, export quota restrictions on the export of seamless and welded casing and line pipe items.

Quota restrictions on major oil products were lifted by the OIT effective April 1.

Announcing that pipe and other products would be placed on open-end quotas, Secretary of Commerce Charles Sawyer explained that this "further relaxation of export controls is based on the rapid easing of domestic iron and steel supplies.

"Present conditions," Sawyer said, "justify our action of providing United States iron and steel producers and exporters greater access to the world market. The action is in line with our policy of relaxing export controls whenever possible without creating undue impact on the domestic economy or endangering national security."

Under the open-end provisions, exporters must continue to apply for validated licenses and must observe all other applicable regulations. The OIT will continue its present practice of screening all applications for end-use and excessive quantities.

Commission Loses Suit For Control Over L.P.G.

BATON ROUGE. — District Judge Charles A. Holcomb last week ruled against the Public Service Commission in its attempt to assume jurisdiction over the liquefied petroleum gas industry, now held by the Liquefied Petroleum Gas Commission.

The latter body, created in 1942, successfully held that the legislature had authority to give it supervision over the fuels.

Dutra Visit May Result In Future Oil Deals

WASHINGTON. — The basis of agreements which may result in the opening up of Brazilian oil reserves to development by United States oil companies was reached last week by President Truman and President Eurico Gaspar Dutra.

The chief executives of the two countries made formal announcement of the accord shortly before President Dutra ended a 3-day visit to Washington.

The statement said the two presidents discussed at length the desirability of fostering economic development and social progress and had agreed upon programs, to be worked out later by experts, involving economic, financial and technical help to Brazil, joint efforts to eliminate double taxation, and Brazilian efforts to stimulate private American investment in that country.

The agreement also laid the groundwork for financial aid by the Washington Government for "appropriate development projects not suited to private financing, such as those projects which have already been accepted for financing by the International Bank for Reconstruction and Development and the Export-Import Bank."

Brazil is understood to be interested in the possibilities of financing development of its oil resources, in line with the so-called Abbink report by the joint Brazil - United States technical commission, and for some time the Brazilian Government has been pressing for modification of the oil laws to permit participation by American companies.

The technical discussions are expected to start in a few weeks, when the Brazilian minister of finance is due to visit the United States.

Plymouth Will Acquire General Oil Sales Corp.

Acquisition of the capital stock of General Oil Sales Corp. was approved last week by stockholders of Plymouth Oil Co.

The move will give Plymouth 100 per cent ownership of Republic Oil Refining Co., a substantial interest in two pipe-line operations, plus an increase from one-fourth to three-eighths interest in Melben Oil Co.

Melben currently is involved in offshore drilling operations in the Gulf of Mexico.

_____this week

INTERNATIONAL—First well ever drilled in Ethiopia spudded by Sinclair Petroleum Co. in Gumburo Hills district of Ogaden province. . . . Formations encountered will determine total depth. . . . ¶Provisions of Syrian contract for operation of Tapline disclosed. . . . ¶Dominican Republic consultants discussing plans of proposed $15,000,000 refinery. . . . ¶A. T. Proudfit tells Creole Petroleum Corp. stockholders company position strong in spite of 31.5 per cent cut in budget. . . . Maximum production of light crude oils may offset cutbacks in heavy-crude output, enabling company to end 1949 with production close to that of 1947. . . . ¶Study of world production figures shows drop of 225,000 bbl. daily during March. . . . Major part of reduction is in United States and Venezuela. . . .

PIPE LINES—Coastal Pipe Line Co. plans 1,000-mile natural-gas line from Texas to Norfolk, Va. . . . Montana-Wyoming Gas Co. formed to provide for an $8,000,000 pipe-line construction project. . . . ¶Construction started on two outlets to serve Scurry County, Texas, fields. . . . ¶United Gas Pipe Line Co. awards contract for construction of 90-mile, 20-in. line from Baxterville, Miss., field to Mobile, Ala.-Pensacola, Fla., area. . . .

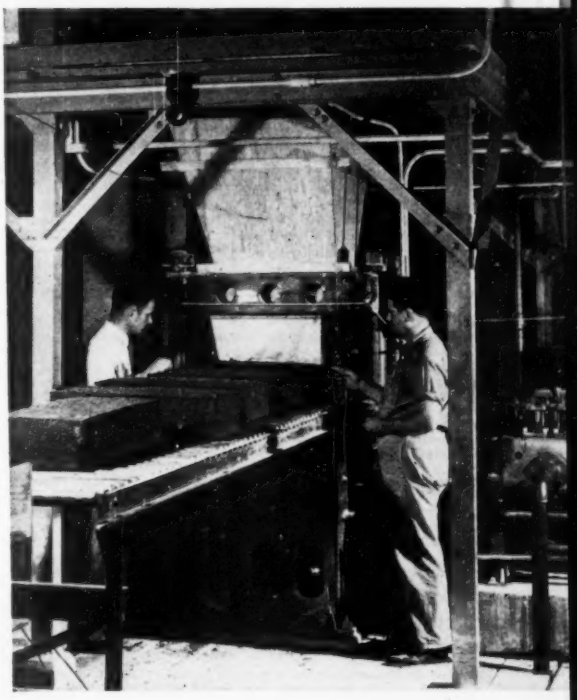
REFINING—Deep Rock Oil Corp. to start major expansion of Cushing, Okla., refinery. . . . Contract awarded for new catalytic cracking plant. . . . ¶Sinclair Oil Corp. announces completion of its postwar refinery expansion program. . . . ¶Frontier Refining Co. introduces "scrubbed" gasoline. . . .

NATURAL GAS—Magnolia Petroleum Co. says work to start soon on new pressure-maintenance and cycling plant in deep Chitwood pool of Grady County, Oklahoma. . . . ¶Erie Gas Service Co. asks FPC permission to build 72 miles of line in northern Ohio. . . .

TRENDS—Crude production for 5-week period ended May 21 averaged 4,915,000 bbl. daily. . . . This is 500,000 bbl. or 9.2 per cent under average for same period last year. . . . ¶Stocks of domestic crude oil increased at the rate of 109,000 bbl. daily in latest 4-week period. . . . ¶Indicated crude-oil imports averaged 417,000 bbl. daily in same period. . . . ¶Refinery runs of foreign crude were 366,000 bbl. per day and stocks of imported crude increased at the rate of 51,000 bbl. daily. . . .

GOVERNMENT—Texas Railroad Commission cuts allowable for sixth consecutive month. . . . Counting new discoveries, production will remain at about May 1 rate. . . . ¶Commission picks Yantis field as first study of underground waste of oil. . . . ¶Idea of compromise on tidelands question given impetus by views of Senator O'Mahoney. . . . ¶Federal Power Commission sends conflicting reports to committee studying Kerr-Thomas bill to amend Natural Gas Act. . . . ¶Reconstituted Armed Services Petroleum Board told to formulate oil-mobilization plan for future emergency. . . .

INDUSTRY—Superior Oil Co. runs world's longest string of casing in hole of world's deepest well. . . . Seven-inch string is cemented at 19,765 ft., total depth. . . . ¶Oil Industry Information Committee sets aside entire week as Oil Progress Week this year. . . . ¶American Petroleum Institute assures fuel-oil consumers there will be no shortage this year. . . . ¶Public Service Commission in Louisiana loses suit it brought in effort to gain jurisdiction over liquefied petroleum gas industry. . . . ¶Russell B. Brown charges major companies with increasing oil imports. . . . Asks Congress to take action "to protect the domestic industry." . . .



Blocks of "cold rubber" being produced at the plant of Copolymer Corp. at Baton Rouge, La., opened for public inspection May 24. The plant is operated for the federal Government by eight tire companies who cooperated with Phillips Petroleum Co. in developing the new cold-reaction process for making synthetic rubber said to give 30 per cent better tire mileage

5,450 Miles of Crude, Product Lines Now Under Construction

by Paul Reed

PETROLEUM-PIPE-LINE construction continues well above the normal rate in the United States and foreign countries with approximately 5,450 miles now under way and 10,850 miles under consideration for the future. These figures, together with 780 miles of projects already completed in 1949, give a total of 17,080 miles representing the current status of petroleum-pipe-line undertakings. When this is added to the 28,200 miles of natural-gas lines *(The Oil and Gas Journal, May 12, page 66)* the magnitude of combined petroleum and natural-gas projects in all categories is 45,280 miles. Reports of major projects under consideration which have not yet been announced indicate that such a final combined total for the world may be raised to more than 50,000 miles before the end of 1949.

Foreign petroleum-pipe-line programs totaling 9,600 miles are 22 per cent higher than those for the United States mostly due to the magnitude of big-inch plans in the Middle East which will require more than 5 years for completion. These amount to approximately 5,206 miles, including current construction of Iraq Petroleum Co., Ltd.'s, 16-in. system, Kuwait Oil Co.'s 4-30-in. Permian Gulf system, and Trans-Arabian Pipe Line Co.'s 30-31-in. and the subsequent projects to be undertaken successively for Mediterranean outlets with diameters between 30 in. and 34 in. for Middle East Pipe Line Co., Kuwait Oil Co. and Iraq Petroleum Co.

Foreign Lines Important

Abroad, crude-oil lines completed this year and under way total 3,250 miles, while construction of 4,200 miles has been planned for the future. Foreign products lines under way and planned total 2,150 miles.

Predominant in the 7,480 miles of domestic petroleum-pipe-line programs is the project for increasing crude-oil deliveries from the Southwest and South into the St. Louis-Chicago-Toledo region. Approximately 1,250 miles of line will be completed this year for a connected series of lines extending from Jal, N. M., to Wilmington, Ill., in the Chicago area, including Basin System's (Texas Pipe Line Co., Shell Pipe Line Corp., Empire Pipe Line Co. and Sinclair Refining Co.) 576-mile, 20-22-24-in. Jal, N. M.-Cushing, Okla., 1947-49; Ozark System's (Shell and Texas) 435 miles, 22-in., Cushing, Okla.-Wood River, Ill., 1948-49; Texas Pipe Line Co.'s 55-mile, 22-in. Wood River-Patoka, Ill., 1949; and Texas Empire Pipe Line Co.'s Patoka-Wilmington, Ill., 183-mile, 18-in., 1949.

Mid-Valley Pipe Line Co. [Standard Oil Co. (Ohio) and Sun Oil Co.] will further augment crude-oil delivery facilities into the St. Louis-Toledo region by the 1,000-mile, 20-22-in. Longview, Tex.-Lima, Ohio, line on which construction is due to start early in the fall.

The Chicago area may receive crude oil from western Canada by a possible extension of the Edmonton-Regina, Alta., line projected by Imperial Oil, Ltd., interests. Such an extension is being discussed but no announcement has been made.

The 6,000 miles of crude-oil projects in the United States include 2,300 miles of lines completed and under construction and 3,700 miles of planned projects. These include two 1,000-mile lines from West Texas to California, neither of which is likely to materialize soon because of existing crude-oil-supply conditions. When conditions become favorable it seems reasonable that only one outlet to the West Coast would be built. Of the 1,480 miles involved in domestic products line construction schedules, 530 miles represent completed lines and under way; 950 miles are projected for the future.

In the accompanying tables, lines classified as completed have already been finished in 1949.

PRINCIPAL DOMESTIC CRUDE-OIL PIPE-LINE PROJECTS

Company—	Length (miles)	Diameter (in.)	Status	Contractor, location, and completion date
Arizona Pipe Line Co.	600	8	Planned	Permian basin-Phoenix, Ariz.
Atlantic Pipe Line Co.	30	8	Completed	A. C. Holder—Refugio to Crane.
Atlantic Pipe Line Co.	420	10	Under way	Holder-Evans and James—Crane to Harbor Island, Tex., 9-10-49.
Buckeye Pipe Line Co.	82	22	Under way	Anderson Bros.—Lima to Toledo, Ohio.
Cooperative Refinery Association	48	8	Authorized	Cowley County, Kansas.
Humble Pipe Line Co.	370	16 or 18	Considered	West Texas-Satsuma Sta. to Baytown, Tex., fall of 1951.
Interstate Oil Pipe Line Co.	22	8-12	Completed	O. C. Whitaker—Panther Creek Junction to Oklahoma City—Foster to Elmore City.
Interstate Oil Pipe Line Co.	85	12	Under way	C. B. Edmonds Transportation Co.—Elk Basin to Billings, Mont.
Lion Oil Co.	11	2-3-4	Completed	Ouachita to Smackover-El Dorado.
Mid-Valley Pipe Line Co. (Sun and Sohio)	1,000	20-22	Planned	Longview, Tex., to Mayersville, Miss.—Covington, Ky., to Lima, Ohio.
Pan American Pipe Line Co.	16	6-8	Authorized	Loop, Quitman to Kilgore, Tex.
Phillips Pipe Line Co.	44	8	Under way	Bill Morrison Const. Co.—Wichita, Kans., to Kansas City, Mo., loops, 6-25-49.
Phillips Pipe Line Co.	289	12	Under way	Morrison Bros.—Odessa to Borger, Tex., 5-49.
Portland Pipe Line Co.	236	20	Planned	Portland, Me., to Montreal, Que., Canada.
Shell and other companies	1,000	20	Considered	Wink, Tex., to Wilmington, Calif., 1950-1952.
Shell Pipe Line Corp. (Ozark)*	435	22	Under way	Midwestern, Smith Contracting, Anderson Bros.—Cushing, Okla., to Wood River, Ill.
Shell Pipe Line Corp.	33	12	Under way	Smith Contracting—Wasson Sta., W. Tex., to Hobbs Sta., N. M.
Shell Oil Co., Inc.	4	6	Authorized	Kern Bluff field to Round Mountain.
Shell Oil Co., Inc.	2	6	Completed	Hood Const. Co.—Coffee Canyon, Calif., 3-49.
Sinclair Refining Co.	20	3-8	Under way	Bill Morrison Const. Co.—Madison, Kans.-North, 5-25-49.
Sinclair Refining Co.	90	2-8	Completed	Bill Morrison Const. Co.—Wewoka to Pauls Valley, Okla., 4-25-49.
Socony-Vacuum Oil Co., Inc. (White Eagle Div.)	122	8	Considered	Big Horn Basin to Casper, Wyo.
Socony-Vacuum Oil Co., Inc.	22	6	Under way	Reading Spur to Reading, Pa., 4-15-49.
Standard Oil Co. of California	10	10	Under way	Pacific Pipe Line Engrs., Ltd.—Wilmington and Torrance.
Standard Oil Co. of California	16	6 and 10	Authorized	Wilmington to Torrance; West Montalvo to San Buena Ventura.

Company—	Length (miles)	Diameter (in.)	Status	Contractor, location, and completion date
Stanolind Pipe Line Co.	31	10-12	Under way	C. S. Foreman—Elmont and Blaine Sta., Kans., loops.
Stanolind Pipe Line Co.	75	16	Completed	C. S. Foreman—Washington, Kans., and Freeman, Mo., loops, 4-49.
Stanolind Pipe Line Co.	62	12	Completed	Sheehan Pipe Line Const. Co.—LaPlata, Mo., and Wood River, Ill., loops, 4-49.
Sun Pipe Line Co.	61	4-10	Authorized	Seabreeze to Sun Station, Tex.
Sunray Oil Corp.	8	6⅝	Completed	Pipe Line Service Co.—Tussey Sta. to Velma, Okla.
Texas Empire Pipe Line Co.	183	18	Under way	H. C. Price Co., Anderson Bros. Const. Co., Bechtel Corp., Conyes Const. Co.—Patoka to Wilmington, Ill.
Texas Empire Pipe Line Co.	47	10	Completed	Williams Bros. Corp.—Cushing to West Tulsa, Okla.
Texas Pipe Line Co.	187	12	Authorized	Wichita Falls to Corsicana, Tex.
Texas Pipe Line Co.	15	10-8-6	Under way	Associated Pipe Line Contr., Inc.—Wharton County, Tex.—Wharton and El Campo, 5-1-49.
Texas Pipe Line Co.	55	22	Under way	Sheehan—Patoka to Wood River, Ill., 8-49.
Texas Pipe Line Co.†	173	24	Under way	Smith Const.—Wichita Falls, Tex., to Cushing, Okla.
Texas-Western Oil Lines, Inc.	1,000	20-24	Proposed	Midland-Odessa area, Texas, to Los Angeles, Calif.
Toronto Pipe Line Co.	10	3	Completed	T. & L. Const. Co.—Maud pool to N. Belmont pool.
Union Oil Co. of California	20	8-10	Planned	Miscellaneous crude and products.

*Ozark Pipe Line System of Shell Pipe Line Corp. and Texas Pipe Line Co. Shell Pipe Line Corp. is handling construction.
†Basin (Jal-Cushing) System of Texas Pipe Line Co., Shell Pipe Corp., Empire Pipeline Co., Sinclair Refining Co., Texas Pipe Line Co. is handling construction.

PRINCIPAL PRODUCTS PIPE-LINE PROJECTS

Alamo Refining Co.	24	8	Under way	Latex-Sweeney refinery to Freeport, Tex., Gulf Coast.
Connecticut Pipe Line Co.*	40	8	Planned	New Haven to Hartford, Conn.
Plantation Pipe Line Co.	13	8	Authorized	Helena to Birmingham, Ala.
Phillips Petroleum Co. and Shamrock Oil & Gas Co.*	152	6	Planned	La Junta to Denver, Colo.
Shell Oil Co., Inc.	17	4	Completed	Hood Const. Co.—Wimington to Los Angeles, 3-49.
Sinclair Refining Co.	26	8	Completed	John Meehan & Son Const. Co. and Ralph Hopple—Marcus Hook to Philadelphia, 4-49.
Sinclair Refining Co.	270	8	Under way	Company crews and outside contractors—Redel, Kans., to Wood River, Ill., recondition crude line for products, 2-1-49.
Sinclair Refining Co.	700	8	Planned	Sinclair, Wyo., to Kansas City.
Socony-Vacuum Oil Co., Inc.	127	6	Completed	Associated Cont. & Engr.—Portland to Bangor, Me.
Socony-Vacuum Oil Co., Inc. (Eastern P. L. Div.)	22	6	Completed	Midwestern Const.—Malvern to Reading, Pa., 4-49.
Socony-Vacuum Oil Co., Inc.	7	6	Under way	Midwestern Const.—Allentown, Pa., spur, 2-49.
Socony-Vacuum Oil Co., Inc.	18	6	Considered	Christmans to Hazleton, Pa.
Socony-Vacuum Oil Co., Inc.	5	6	Considered	Taylor to Exeter, Pa.
Susquehanna Pipe Line Co.	11	6	Completed	R. L. Coolsaet Const. Co.—Connecting Detroit Southern Pipe Line-Sun Oil Co. terminal, River Rouge.
Tuscarora Oil Co., Ltd.	21	10	Under way	Pipe Line Const. & Drlg. Co.—East Waterford, Pa., West, 6-1-49.
Union Oil Co. of California	10	6	Planned	Torrance to Rosecrans.

*Deferred.

PRINCIPAL FOREIGN CRUDE-OIL PIPE-LINE PROJECTS

Company—	Length (miles)	Diameter (in.)	Status	Contractor, location, and completion date
Anglo-Iranian Oil Co., Ltd.	56	20-22	Under way	Agha Jari to Mashur, Iran.
Creole Petroleum Corp.	143	24-26	Completed	Williams Bros.—Ule-Amuay, Venezuela.
Corporacion de Fomento de Chile	45	8	Planned	Cerro Mantiales (Springhill) to Caleta Clarencia (on Bahia Gente Grande).
Imperial Pipe Line Co.	450	16	Planned	Edmonton area, Regina, Canada.
Imperial Oil, Ltd.	350	..	Considered	Regina, Sask., to Winnipeg, Man., Canada.
Iraq Petroleum Co., Ltd.	1,080	16	Under way	Company crews—Kirkuk, Iraq, to Haifa, Palestine, and Tripoli, Lebanon.
Iraq Petroleum Co., Ltd.	556	30-32	Planned	Iraq-Levantine port.
Kuwait Oil Co. (Gulf and Anglo-Iranian)	1,100	30	Planned	Kuwait, Arabia, to Levantine port.
Kuwait Oil Co. (Gulf and Anglo-Iranian)	600	4-30	Under way	Bechtel—Kuwait, Arabia.
Middle East Pipe Line Co.	800	34-36	Planned	Iran-Levantine port.
Petroleos Mexicanos	145	12¾	Considered	Reynosa to Monterrey, Mexico.
Petroleos Mexicanos	280	12¾	Authorized	Poza Rica to Salamanca, Mexico.
Richmond Exploration Co.	25	16-18	Completed	Williams Bros.—Boscan field to Lake Maracaibo, Venezuela.
Santos Jundiai Railroad	30	18	Planned	Santos to Sao Paulo, Brazil.
Trans-Arabian Pipe Line Co.	1,070	30-31	Under way	Bechtel-Abqaiq, Saudi Arabia, to Sidon, Lebanon.
Yacimientos Petroliferos Fiscales de Argentina	400	..	Planned	Plaza Huincul to Bahia Blanca, Argentina.
Yacimientos Petroliferos Fiscales de Bolivianos	255	6	Under way	Williams Bros.—Camiri to Cochabamba to Sucre, Bolivia.

FOREIGN PRODUCTS-LINE PROJECTS

Petroleos Mexicanos	160	10¾	Authorized	Minatitlan to Salina Cruz.
Cia. des Pipe Lines Petroliers Francais	150	10	Planned	Le Havre to Paris, France.
Colombian Government	342	..	Planned	Puerto Berrio to La Dorada, 92 miles; La Dorada to Bogota, 110 miles; La Dorada to Cartago, 140 miles.
Creole Petroleum Corp.	10	8	Authorized	Catia de la Mar to Nueva Caracas, Venezuela.
Ministry of Petroleum of Colombia and Antioqua R.R.	107	..	Planned	Puerto Berrio to Madellin, Colombia.
Queont Pipe Line Co.	330	..	Planned	Montreal, Que., to Toronto, Ont.
Santos Jundiai Railroad	40	10	Planned	Santos to Sao Pauli to Campinas, Brazil.
Svenska Enterprenad Aktiebolget	220	..	Planned	Uddevalla to Vasteras, Sweden.
United Kingdom Government	150	6	Under way	Shell Petroleum Co. supervision—Mtwara, near Lindi, to Ground Nuts area, Tanganyika, Africa.

Tidelands Compromise Given Impetus by O'Mahoney Views

WASHINGTON. — The idea of a compromise between the federal and state governments to settle the issue of the tidelands was given impetus last week by the disclosure that Sen. Joseph C. O'Mahoney, of Wyoming, chairman of the Senate Interior and Insular Affairs Committee, was giving serious consideration to the possibility of such an agreement.

O'Mahoney pointed out that neither the quitclaim bill nor the bill for federal administration of the tidelands has any chance of enactment at this session of Congress and said it is important that the matter be settled with a minimum of delay.

The Wyoming senator is the sponsor of a bill for federal administration, and his committee is in charge of tidelands legislation. He has consistently supported the administration's side in the controversy and voted against the quitclaim bill, which was passed by the last Congress and vetoed by President Truman.

O'Mahoney and several other members of Congress have had informal discussions with Attorney General Tom C. Clark and Interior Department officials, and it is represented that the former, at least, has indicated he would not be unalterably opposed to a compromise. Greatest unknown quantity, however, is President Truman, who will not accept any sort of a deal under which the Government would lose any of its present advantage, according to Interior Secretary J. A. Krug.

O'Mahoney did not indicate what sort of a compromise he is considering, but on the House side there is considerable support for a proposal by Rep. John E. Lyle, Jr., of Texas, for a delimitation of the respective areas of federal and state ownership, a split of the revenues from both areas between the federal and state governments, and joint administration of regulation and leasing.

Yantis Field Is Picked For Oil-Waste Study

AUSTIN.—The Texas Railroad Commission has set June 29 as the date for a hearing on Yantis field, Wood County, to determine "why some type of pressure - maintenance program should not be instituted."

The hearing will be the first held by the commission for the purpose of checking a Texas field with a view to curbing underground waste of oil. It comes on the heels of the commission's successful fight to reduce the flaring of casing-head gas.

First hint of the action was made by W. M. Murray, commission chairman, in an address May 6 before the Petroleum Engineers Club of Dallas *(The Oil and Gas Journal, May 12, page 56)*. At that time he said that if the inquiry were successful, similar hearings might be expected on other fields, adding that "there is no legal reason to believe that the courts would not interpret the underground loss of oil as much a waste as the flaring of gas."

Yantis field was discovered by Humble Oil & Refining Co. in January 1948, with oil production coming from the Eagleford zone. Since then, 20 oil producers have been added, all drilled on 20-acre spacing.

Daily production currently is about 700 bbl., with production being allocated 75 per cent to acreage and 25 per cent on a per-well basis. Humble, with eight wells, is the largest operator in the field. Others, owning from one to four wells, are T. N. Berry & Co., Ginther, Warren & Ginther, Great Expectations Oil Corp., Sam G. Harrison, Hedge & Cross, and W. H. Taylor. Gas production also is being obtained from the Rodessa zone.

Next Week

Contract drilling.—Harry E. Winter, Union Oil Co. of California, gives an up-to-the-minute discussion of the different drilling-contract forms, various types of pay rates, and the many contingency problems in the business. This is "must" reading for drilling contractors and oil-company drilling departments.

Underground storage of propane.—Description of unique new plant in Michigan which stores propane, natural-gas, and air mixtures in a depleted gas field—to meet high peak demands in winter. In one 3½-month period, 1,194 tank cars of propane (11,570,900 gal.) were stored via 293 wells.

Esso Standard's Bayway refinery.—The Journal's refining editor describes makeup of company's administration-construction-operating coordinating program giving organizational charts, use of scheduling boards, details on periodic meetings.

Gas-injection case history.—West Coyote oil field reservoir characteristics, gas-injection program, and operational results are told by F. S. Fowler, Standard Oil Co. of California.

Pipe-line field welding.—Application of X-ray photographs and how they are interpreted, as aids in pipe-line welding. By R. R. Hughes, chief engineer of Industrial X-ray Engineers.

Lubricating greases.—Over-all discussion of this subject, including grease classifications, relative performances, physical tests, additives, and other phases, are reported on by George W. Miller, Battenfeld Grease & Oil Corp.

In this issue the international feature and international news items and the Washington material, including Watching Washington, will be found in a section beginning on page 157.

Consumers Can Be Assured Of Fuel Oil, A.P.I Says

Consumers may be assured of a continued supply of fuel oil during the 1949-50 heating season, "regardless of the severity of the weather," American Petroleum Institute reports, in pointing to the oil industry's multi-billion-dollar expansion program, and its record of service and performance.

The statement notes that consumers had "no reason for concern last winter" and that the industry ended the heating season with record-breaking inventories in storage for this time of year. Normal refining operations will increase these inventories further this year, the A.P.I. says, and the vast expansion program on which the petroleum industry has spent billions of dollars since end of the war will more than handle the additional half-million or more new heating units which are expected to be installed during 1949.

Gulf Buys Marketing Facilities From Pure

Pure Oil Co. has sold its retail marketing facilities in Eastern Pennsylvania to Gulf Oil Corp. for an undisclosed sum.

The disposal of the Pennsylvania outlets is in line with Pure's program of consolidating its marketing in the Midwest.

PERSONALS

Sherman Is Veteran of Venezuelan Operations

HOYT SHERMAN, who recently became president of Mene Grande Oil Co., brings to his new duties a broad knowledge of the Venezuelan oil business which is based on 21 years' experience with the industry in that country.

Sherman succeeded Chester M. Crebbs, who retired after a 26-year administration of the company during which it was transformed from a relatively small organization into one of the "big three" operators in Venezuela.

Born 53 years ago in Chicago, Sherman was graduated from the Brookline, Mass., High School and from Harvard University. During World War I he served 2 years as an infantry officer in France. In 1919 he joined New England Oil Co. and served with that company in various capacities, chiefly in connection with its interests in Mexico and Venezuela.

He joined Gulf Oil Corp. in the New York office in 1927 as assistant to C. W. Hamilton, now vice president of the New York production division in charge of foreign operation. A year later he went to Venezuela as assistant manager of Venezuelan Gulf Oil Co. in Maracaibo.

After transfer of the assets of Venezuelan Gulf to Mene Grande and removal of its main offices to Caracas, Sherman became general manager. Transferred in 1939 to Eastern Venezuela, he remained in San Tome until 1947 when he was named vice president and moved to Caracas.

Henry M. Noel has returned to the United States after an assignment of about 5 months as refining consultant to the military government in Japan. Noel was on leave from Standard Oil Development Co. for which he is a technologist in the process division at Bayway, N. J.

R. F. Sawyer, formerly assistant superintendent of Joe's Lake, Tex., district for American Republics Corp., has been appointed division superintendent of operations for the company in Beaumont, Tex. He will supervise all drilling and production operations in the Bancroft-Hull area.

B. P. Eastin has been appointed regional exploitation engineer for Shell Oil Co., Inc., replacing **W. C. Chonette,** who recently was made manager of the Los Angeles Basin division.

Earl J. Sour, chief assistant purchasing agent for Skelly Oil Co., has been appointed purchasing agent, succeeding **Fred W. Robertson,** who has retired because of ill health.

S. D. Liles, engineer, Lone Star Producing Co., formerly district production engineer in the company's east-central district, Athens, Tex., has been made assistant field supervisor, with headquarters in Dallas. **H. M. Bramley,** formerly district production engineer of the East Panhandle district, at Shamrock, has been made district production engineer in the West Texas district, with headquarters at Colorado City. **Jack Gourley,** who was stationed at Eastland as production engineer, has been made district engineer at Shamrock.

G. A. Plummer, Lone Star Producing Co., has been named chief scout in the company's West Texas territory, with supervision over all scouting activities except East Central Texas and Oklahoma. Headquarters will continue at Eastland, Tex.

P. G. Wright, Jr., Magnolia Petroleum Co. producing department, has been promoted to production foreman in the Kermit district. He was formerly in the Brownfield producing district. **Glen W. Barb,** petroleum engineer in the Alice producing district, has been transferred to Morgan City, La. In the company's natural-gas department, **John R. Ackenhausen** has been transferred from plant foreman at Mamou, La., to district engineer of the Wewoka, Okla., natural-gas district; **William R. Stephens,** plant foreman at the Kenova gasoline plant, Union, Ark., has been transferred to the Mamou plant; and **John E. Shannon,** field foreman at Mamou, has been transferred to the Panhandle district's Kickok, Kans., gasoline plant.

M. W. Belson, of D. E. Stearns Co., is the new chairman of the Shreveport chapter of the National Association of Corrosion Engineers. Other officers elected include **H. V. Beezley,** of United Gas Pipe Line Co., vice chairman; **J. M. Olive,** Arkansas-Louisiana Gas Co., secretary; and **J. A. Creevy,** Continental Supply Co., treasurer.

B. S. Letcher and **C. L. Harding** have been elected to the board of directors of Arabian American Oil Co. They replace **A. N. Kemp,** a director of Standard Oil Co. of California, and **B. B. Jennings,** president of Socony-Vacuum Oil Co., Inc. Letcher also is a vice president and director of Standard of California, while Harding is a vice president and director of Socony-Vacuum. At the same time, Trans Arabian Pipe Line Co. announced Letcher had been elected to its board of directors, succeeding **H. D. Armstrong.** The latter is assistant to the chairman of Standard of California board.

Harold Bottomly, formerly chief process engineer for Refinery Engineering Co., Tulsa, has been named a vice president of the company.

H. O. Harder, general superintendent of production, Sunray Oil Corp., Tulsa, has been elected vice president in charge of production, succeeding **James K. Ellis,** who resigned, and is moving to San Antonio to become associated with the Slick-Urschel Oil Co. interests. Harder has been associated with Sunray since 1945, when he joined the firm as assistant general superintendent.

Norman E. Maxwell, Jr., petroleum engineer with The California Co., Laramie, Wyo., has been transferred to Waterproof, La., where he will serve the company in the same capacity.

Mayo M. Iles, assistant to the president of Louisiana Central Oil & Gas Co., Clarks, La., has been appointed assistant general manager of the company.

R. D. Rhinehart, Gulf Oil Corp. assistant area production superintendent at Crane, Tex., has been transferred to the Wickett, Tex., area. He will be replaced at Crane by **Tom R. Coffield,** who will serve the McElroy,

PERSONALS

Tex., area as assistant area production superintendent. **G. L. Cockrum** is being transferred to Kermit, Tex., as production foreman, and **J. L. Hoestenbach**, Goldsmith, Tex., has been made production foreman in the McElroy area. **T. W. Kidd**, who has been in the Sandhills area, will move to the Crane office as area petroleum engineer, and **H. J. Ritts, Jr.**, McElroy, will move to Sandhills as field petroleum engineer.

Vincent L. Quinlan and **Jerry V. George**, petroleum engineers for Magnolia Petroleum Co., have exchanged district headquarters. Quinlan was transferred from the Lake Charles, Tex., district to the Brownfield, Tex., district, and George was transferred from Brownfield to Lake Charles.

M. C. HOFFMAN

M. C. Hoffman, veteran production executive for Stanolind Oil & Gas Co., has been named general manager of production and exploration for Root Petroleum Co. His appointment is effective June 1 and he will move from Tulsa to Root's headquarters in Shreveport. He formerly was with Midwest Refining Co. for 10 years and has been connected with Stanolind's operations since 1931.

Three oil men have been nominated for reelection as directors of the California State Chamber of Commerce. They are **H. D. Collier**, chairman of the board of Standard Oil Co. of California; **A. C. Mattei**, president of Honolulu Oil Corp., and **E. R. Valentine**, vice president of Fullerton Oil Co.

Ernest E. Cudby and **Ronald C. Richardson**, production engineers with Standard Oil Co. of California at Edmonton, Alta., Canada, were in Tulsa recently taking a training course on oil-field practices given by Baroid Sales Co.

Gage Lund, vice president and a director of Standard Oil Co. of California and chairman of the board of the subsidiary, Richmond Exploration Co., arrived in New York last week on his way back to San Francisco following a trip visiting Richmond's operations in Venezuela.

Howard H. List, area engineer for Shell Pipe Line Corp., Houston, has been transferred to Springfield, Mo., where he will be in charge of station construction on the company's Ozark pipe-line project.

Don B. Pruess, process engineer in the refining division of Cities Service Oil Co. (Del.), has been transferred to a subsidiary company, Petroleum Advisors, in New York City.

James Tanham, vice president of The Texas Co., New York, has been elected a director at large of the U. S. Chamber of Commerce.

H. R. Cullen, president of Quintana Petroleum Corp., Houston, and **George A. Hill, Jr.**, president of Houston Oil Co. of Texas, have been elected to the board of trustees of the Southwest Research Institute of Houston and San Antonio.

J. H. Cobb and **J. P. McGowan** will staff the new office of Continental Oil Co. in the Smith Building, Corpus Christi.

Charles E. Edgerton has joined Luling Oil & Gas Co. as chief geologist, with offices in San Antonio. Edgerton was formerly division geologist for American Republics Corp.

David M. Graham has been named temporary Southwest Texas district geologist for American Republics Corp., with headquarters in San Antonio.

T. F. Taylor, formerly Southwest Texas district geologist for Pan American Production Co. in Houston, has become associated with **Basil B. Zavoico**, Houston.

Oscar Bocock, formerly district geologist for The Texas Co. in Corpus Christi, has joined the firm of Hawn Brothers, Corpus Christi. Bocock is a native of Idaho and received his degree at the University of Colorado.

Alan E. Hall has been appointed superintendent and **Harold G. Russell** assistant superintendent of the research and development department of Bahrein Petroleum Co., Ltd., at the Bahrein, Persian Gulf, refinery. Hall succeeds **George S. Windle**, who has been transferred to the New York office of California Texas Oil Co., Ltd.

Cornelius Willem Euwe, formerly at Curacao, N.W.I., refinery of Arend Petroleum Mij., has been made works manager at the Monheim, Germany, refinery at Deutsche Shell, A. G. **Dr. Kurt Wissel**, former plant manager, has been transferred to the board of Union Rheinische Braunkohlen-Draftstoff, A. G., at Wesseling, Germany.

Dr. O. Heerman, chief geologist of Deutsche Vacuum Oel, A. G., has left Germany for a visit of several months in the United States with Socony-Vacuum Oil Co., Inc. He is expected to observe exploration and production methods used in the Texas Gulf Coast area.

Harry M. Mitchell has been named chief engineer of Jefferson Chemical Co., Inc., replacing **G. R. Wick**, who has been made assistant to the production engineer. Mitchell formerly served as assistant chief engineer.

J. R. Ellis has been elected a director and vice president of Sunray Pipe Line Co., subsidiary of Sunray Oil Corp. He has been associated with Sunray since May 1947 when he joined the firm at Tulsa, after more than 10 years' pipe-line service with Great Lakes Pipe Line Co. He served with that firm as gager, clerk, chief inspector, and district engineer. Since joining Sunray Ellis has headed the company's pipeline operations.

Alden S. Donnelly has been elected a director and vice president of Honolulu Oil Corp., San Francisco. He has been with the company 18 years and is in charge of operations in the Mid-Continent area, with offices at Midland, Texas.

Norman Klausner, formerly accounting representative at Caracas, Venezuela, for Richmond Exploration Co., and prior to that acting chief accountant at Bogota for Richmond Petroleum Co. of Colombia, has been transferred to Batavia, Java, as assistant chief accountant for N. V. Nederlandsche Pacific Petroleum Mij.

Arthur A. Curtice, president of Conorada Petroleum Corp., New York City, and **M. K. Neptune**, director of foreign department, Continental Oil Co., Ponca City, Okla., recently returned from Caracas where they discussed the possibility of obtaining Venezuelan concessions with **Dr. Pedro I. Aguerrevere**, minister of fomento.

Leonard T. Wilson has been promoted to assistant refinery superintendent in the Martinez, Calif., refinery of Shell Oil Co., Inc. Now serving as department manager in the catalytic-cracking division at the company's Dominguez, Calif., refinery, his new appointment will be effective June 1. **J. D. Davis**, formerly a department manager at Martinez refinery, will replace Wilson.

Palmer S. Lemley, Southern Union Gas Co., is superintendent of the company's new $1,000,000 absorption plant near Bloomfield, N. M.

Roscoe Tucker, chief geophysicist, Cities Service Oil Co., has been named chief geologist. He formerly was president of Tucker Exploration Co., operating in the Rocky Mountain region, prior to rejoining Cities Service 1 year ago.

J. S. Herrin, Thermopolis, Wyo., has been elected president and general manager of Empire State Oil Co. **Francis R. Curtis** was named chairman of the board of directors.

George S. Corey, Shell Oil Co., Inc., Midland, Tex., has been promoted to area geologist, replacing **M. S. Metz,** who was assigned to duty in Canada. Corey has been with the company since 1937.

H. H. Laderli is serving as division manager, and **Allen Ehlers** is division geologist for Skelly Oil Co. in the West Texas-New Mexico division, headquartered at Midland, where the firm is now constructing a modern office building.

Carl J. Westlund has acquired all stock formerly owned by **George C. Johnson** in Westlund-Johnson Drilling Co., and Westlund & Johnson, Inc. **W. C. Murphy,** former drilling superintendent for Carl B. King Drilling Co., has become associated with the two organizations, and will be in charge of all producing and drilling activities.

C. J. Gardner, formerly superintendent of the Coffeyville, Kan., refinery of Sinclair Refining Co., has been named assistant superintendent of the company's East Chicago refinery. Gardner joined the organization at East Chicago in 1919 and rose to the position of heavy oil superintendent. Transferred to Coffeyville in 1940 as assistant superintendent, he succeeded to the top position 2 years ago, and remained until the refinery, closed down last November, was completely dismantled.

W. M. Elmer has been elected treasurer of Texas Gas Transmission Corp., Owensboro, Ky.

Burt E. Hull, president of Trans-Arabian Pipe Line Co., San Francisco, and **Miss Frances Lorraine Huff,** Little Rock, Ark., were married April 19 in New York City.

SHIFTS—

E. N. Mitchell, superintendent, Rocky Mountain Drilling Co., Los Angeles to Long Beach; **Charles B. Corley, Jr.,** engineer, Humble Oil & Refining Co., Talco to Hawkins, Tex.; **L. M. Daugherty,** superintendent, Paul H. Pewitt, Joaquire to Kilgore, Tex.; **H. D. Barrows,** foreman, Continental Oil Co., Toyahvale, Tex., to Roundup, Mont.; **George Allman, Jr.,** engineer, The Texas Co., Daisetta to Liberty, Tex.; **W. H. Drushel,** superintendent, The Texas Co., Daisetta to Liberty, Tex.; **A. T. Pall,** engineer, The Texas Co., Daisetta to Liberty, Tex.; **John P. Townley,** engineer, The Texas Co., Daisetta to Liberty, Tex.; **R. E. Coleman,** foreman, The Texas Co., Denver City to Goldsmith, Tex.

J. E. Low, superintendent, Amerada Petroleum Corp., Fort Worth to Tulsa; **J. A. Slicker,** engineer, Stanolind Oil & Gas Co., Fort Worth to Cisco, Tex.; **Gus F. Obenhaus, Jr.,** engineer, Stanolind Oil & Gas Co., High Island to Beaumont, Tex.; **George A. Donnelly, Jr.,** engineer, Eastland Oil Co., Monahans to Odessa, Tex.; **Harvin L. Landua,** engineer, Humble Oil & Refining Co., Odessa, Tex., to Houston; **G. Wendell Smith,** geologist, Magnolia Petroleum Co., San Antonio to Bismarck, N. D.; **John S. Kelly,** geologist, American Republics Corp., Wichita Falls to San Antonio, Tex.; **Robert H. Martin,** geologist, The Texas Co., Wichita Falls to Amarillo, Tex.

G. F. Abendroth, engineer, Humble Oil & Refining Co., New Iberia, La., to Houston; **T. H. Kimmett,** engineer, The Texas Co., New Iberia, La., to Calgary, Alta., Canada; **J. V. Langston,** engineer, Humble Oil & Refining Co., New Iberia, La., to New Orleans; **H. W. Reineke, Jr.,** engineer, Humble Oil & Refining Co., Westwego to Harvey, La.; **Henry R. Harriman,** engineer, Rocky Mountain Oil & Producing Co., Tampa, Fla., to Gloucester, Mass.; **Paul H. Miller,** engineer, Pana Refining Co., Pana to Canton, Ill.; **Weldon C. Butler,** engineer, Carter Oil Co:, Carmi, Ill., to Grand Rapids, Mich.; **D. G. Herring, Jr.,** geologist, The Texas Co., West Jackson, Miss., to New Orleans; **L. K. Wood,** foreman, Socony-Vacuum Oil Co., Inc., Northampton to Harrisburg, Pa.

Walter Rand, superintendent, The Texas Co., Craig, Colo., to Casper, Wyo.; **W. E. Garst,** engineer, Stanolind Oil & Gas Co., Rangely, Colo., to Midwest, Wyo.; **W. K. Ruckel,** engineer, Amerada Petroleum Co., Glasgow, Mont., to Williston, N. D.; **John N. King,** geologist, Phillips Petroleum Co., Salt Lake City to Oraibi, Ariz.; **Thomas P. Brooks,** engineer, Southern Production Co., Inc., Casper to Parkerton, Wyo.; **Donuil Hillis,** geologist, Fullerton Oil Co., Casper, Wyo., to Hobbs, N. M.; **F. M. Wise,** engineer, The Texas Co., Casper, Wyo., to Brownsville, Tex.; **Harold Welmar Hansen,** engineer, Tropical Oil Co., Carmen, Okla., to Colombia, South America; **D. R. Boardman,** engineer, Sohio Petroleum Co., Elmore City, Okla., to Novice, Tex.; **T. E. Matson,** geologist, Pure Oil Co., Tulsa to Ardmore, Okla.; **Gus L. Maciula,** engineer, Stanolind Pipe Line Co., Tulsa to Lubbock, Tex.

DEATHS

Francis Marion Ginther, 70, who was associated with his sons, Noble C. and Wilbur L. Ginther in the independent oil business, died in San Antonio May 18.

Allen Savage Williams, 46, owner of the Standard Chemical Sales Co., Houston, died May 17 in Corpus Christi.

C. H. Clark, 80, independent oil operator, died in Wichita Falls, Tex., May 20.

William P. Stenhouse, 78, who retired as office manager of the Whiting, Ind., refinery of Standard Oil Co. (Ind.) in 1936, died May 18 in Chicago.

J. Montgomery Conner, 70, vice president of Benedum-Trees Oil Co., died May 20 at his home in Pittsburgh. He joined the company nearly 40 years ago.

Alex McCutchin, 52, Dallas, independent oil operator, died May 16.

William B. Eubanks, 50, Carthage, Tex., senior clerk, United Gas Co.'s gasoline plant in Carthage, died May 15.

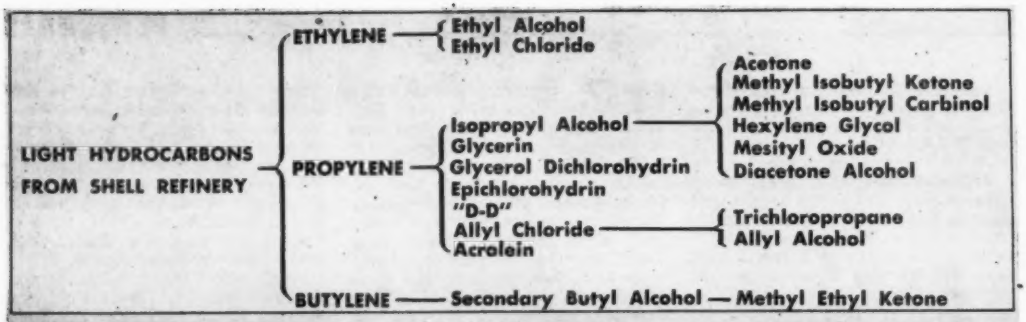
Casper T. Oien, 58, Shelby, Mont., independent oil operator, died May 15 at Wolf Creek, Mont.

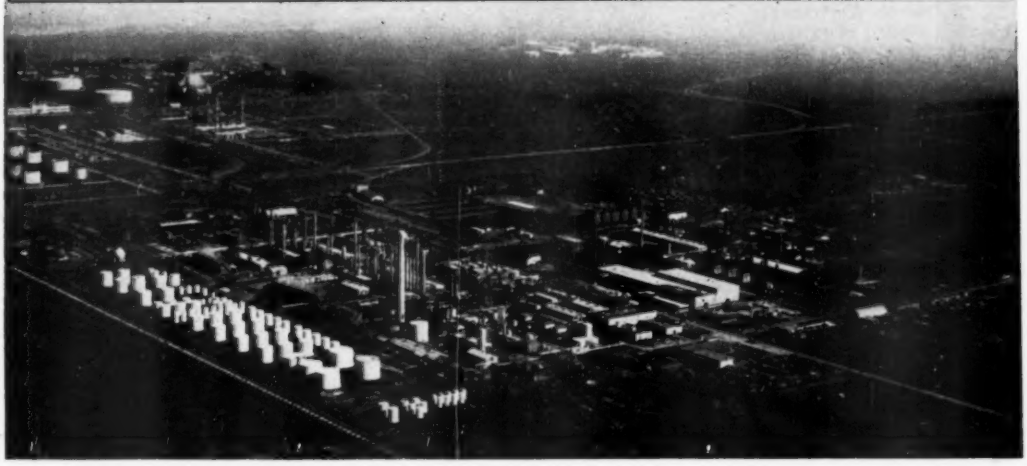
R. E. Lloyd, Jr., 53, retired independent oil operator of Beaumont, Tex., died May 17 in Houston.

Goldie S. Wilkie, 49, drilling superintendent, Louisiana Gulf district, Magnolia Petroleum Co., died May 16 in Morgan City, La.

C. E. Rogers, Wichita Falls, Tex., oil operator, died May 19.

Daniel W. West, 56, Tulsa, independent oil operator, died May 20.





Aerial view of Shell Chemical Corp.'s new Deer Park, Tex., petrochemical plant. Site is 20 miles outside of Houston, adjacent to Shell Oil Co., Inc.'s, 115,000-bbl. refinery. Shown above are the basic raw materials used and commercial chemical products made

Shell Oil Completes $50,000,000 PETROCHEMICAL PLANT EXPANSION

by Leigh S. McCaslin, Jr.

IT has been said of the meat packing industry that it uses everything but the "squeal." The practical completion of Shell Chemical Corp.'s $50,000,000 postwar expansion program at its Houston plant has called forth another appropriate simile, but applying to the oil industry.

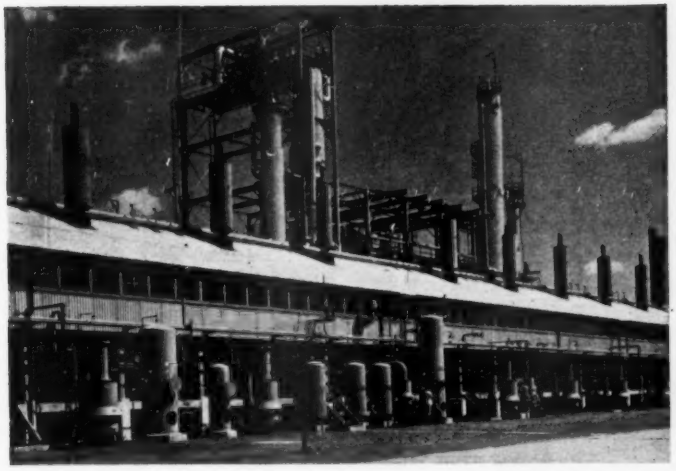
". . . Out of the billions of barrels of oil processed in this country every year, not even the stain has been left." This statement was made by one of the firms which performed a large portion of the construction on Shell's new petrochemical plant—one of the world's largest.

The chemical plant is located 20 miles outside of Houston at Deer Park adjacent to Shell Oil Co., Inc.'s 115,000-bbl. refinery. Refinery products, which in the past have been considered waste but now have alternative valuable uses, are the basic ingredients of the 19 major products produced by the chemical plant. (See accompanying table.) These 19 products, along with the 1,050 other products made by Shell from petroleum, are making full utilization of petroleum. . . . "not even the stain has been left." Many of the products produced at the Shell plant are not made commercially from petroleum at any other plant in the world. These include: glycerin, acrolein, allyl chloride, epichlorohydrin, glycerol dichlorohydrin, 1,2,3-trichloropropane, and "D-D",* a soil fumigant.

The majority of the products produced by the plant are consumed as raw materials in associated chemical industries devoted to the manufacture of paints and lacquers, plastics, medicinals and pharmaceuticals, textiles, and explosives. Few specific production figures are available on the 19

*Trade mark registered U. S. Patent Office.

Right: In this Shell chemical plant, glycerin is being produced synthetically in commercial quantities for the first time in history. Basic raw material is cracked petroleum gas from the adjoining Shell refinery, which enters the plant, along with chlorine and water, at the lower left. Synthesis and purification take place in the units near the center of the photo, and finished, high-purity glycerin is stored in the tanks at far right



Below: Compressor house handling light petroleum fractions in the Shell Chemical plant

major plant products. However, some conception of the total can be obtained by the knowledge that there is storage space at the plant site for 50,000 tons of products of all kinds.

The $50,000,000 spent for the Shell Chemical plant expansion focuses attention on the increasing importance of the Gulf Coast as a chemical center. Petroleum is a major factor in the growth of this region as a chemical manufacturing area. Refinery products and a plentiful supply of natural gas have been most influential in the decision of many industries to locate in the area. Of course, other factors such as climate, level terrain, water supply, and salt and sulfur deposits also have been influential.

More than 80 chemical manufacturing plants have been built in the Gulf Coast area since 1940 and a number are currently under construction. These plants represent an investment that is estimated at between $600,000,000 and $750,000,000. It has been estimated that, with facilities completed and planned, the Gulf Coast will have about 85 per cent of the nation's capacity to produce chemicals from petroleum hydrocarbons.

There is considerable interdependency among the chemical plants in the area. The Shell plant, for instance, receives raw materials from several other companies. Diamond Alkali Co., which is located on adjacent property, supplies chlorine and caustic soda, and Consolidated Chemical Co., nearby, furnishes sulfuric acid.

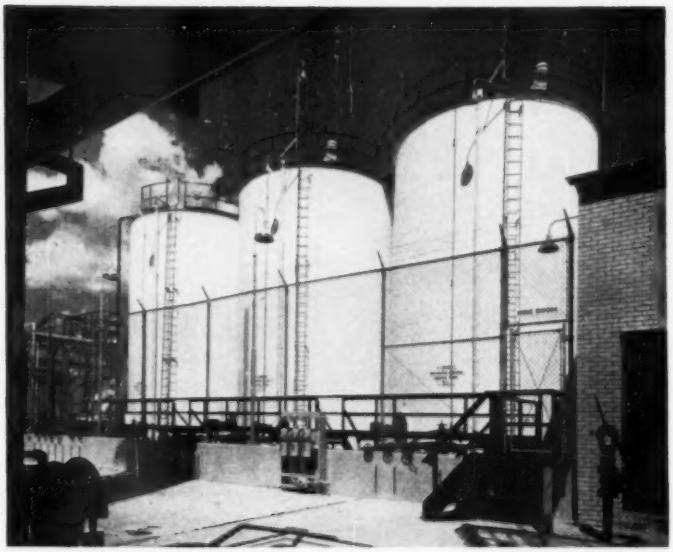
Shell Chemical has found it necessary to supplement its supply of cracking-plant products obtained from the 115,000-bbl. Shell refinery. Several nearby refineries of other oil companies are providing Shell with propylene to supplement that produced by its own units. J. Oostermeyer, president of Shell Chemical Corp., has predicted that "the importance of these outside supplies will continue to increase as our operations expand."

First Construction in 1940

First step by Shell Chemical in the construction of a chemical plant in Houston area was taken in December 1940, when construction was begun on plants for isopropyl alcohol, acetone, and butadiene. Shell Chemical was the first to make butadiene available in commercial quantities for the wartime synthetic-rubber program. These plants went into operation late in 1941 and represented a $4,000,000 investment.

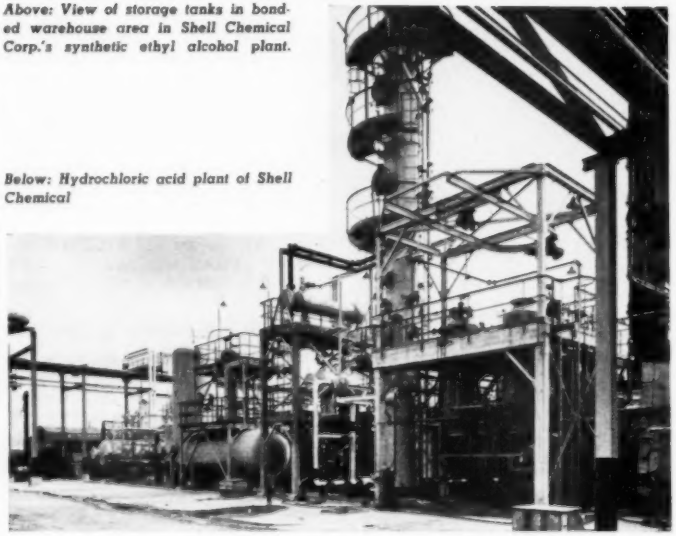
In June 1945 an allyl alcohol plant was completed and placed in operation.

Two more chemical products were added to the Shell's output in 1946 with the completion of plants to produce epichlorohydrin, and glycerol dichlorohydrin. Full-scale operation was begun in August 1947 on a plant to manufacture methyl isobutyl ketone and methyl isobutyl carbinol. The year of 1948 highlighted the $50,000,000 expansion program. Plants were completed during the year for producing secondary butyl alcohol and methyl ethyl ketone, glycerin,



Above: View of storage tanks in bonded warehouse area in Shell Chemical Corp.'s synthetic ethyl alcohol plant.

Below: Hydrochloric acid plant of Shell Chemical



ethyl alcohol, ethyl chloride and hexylene glycol.

In summary, at its Houston site Shell Chemical Corp. actually has 16 separate plants producing 19 major chemical items and employing 1,300 people. However, the postwar program of $50,000,000 does not mean the end of growth at the plant. On the occasion this past September of the dedication of the glycerin plant, Oostermeyer stated, "I can foresee us coming to Texas time and time again with our major manufacturing jobs in the future." More specifically, Oostermeyer has stated in press conferences that the Shell organization already has plans in mind for future expansion of its facilities at the Houston plant site. However, he explained, the plans are still in the embryo stage and not yet ready for publication.

In addition to the chemical plants, a $7,500,000 addition to power-plant facilities has been constructed to serve both the refinery and chemical plants. The three electrical generators in the power plant addition each produce 10,000 kw. of power.

First Synthetic Glycerin

Many of the processes used by Shell Chemical have been developed by company chemists and engineers in their research laboratories. Outstanding among these is that used for the manufacture of glycerin. This Shell-developed process made possible the world's first synthetic glycerin plant—a plant which will produce between 15 and 20 per cent of the nation's present consumption.

A brief description of the process being used to produce glycerin is as follows: First, propylene is chlorinated at relatively high temperatures to form allyl chloride. The allyl chloride is then reacted with caustic soda, chlorine, and water through a series of steps to form a dilute solution of glycerin. The crude glycerin is then concentrated, desalted, and purified. A detailed description of the glycerin plant and the process used can be found on page 86 of the September 16, 1948, issue of The Oil and Gas Journal in an artitle entitled, "World's First Synthetic Glycerin Plant Opens at Houston."

Of particular interest is the $16,000,000 ethyl alcohol plant which is based on a process developed by Shell chemists. No official estimate of capacity has been announced but it is believed that this new plant will manufacture about 10 per cent of the nation's ethyl alcohol.

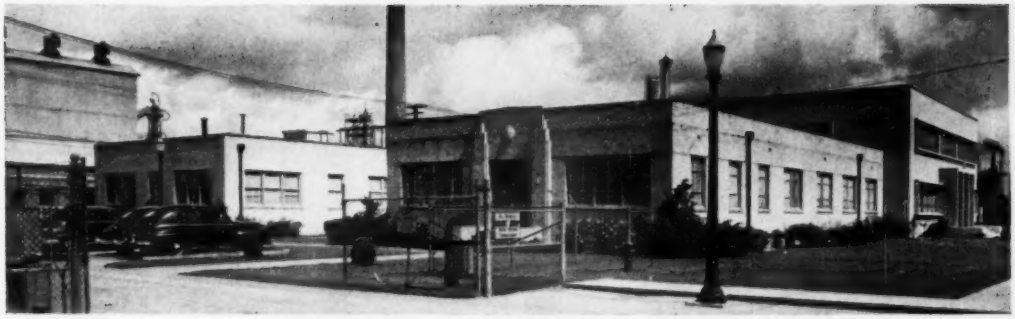
Although the details of the process used for producing ethyl alcohol are a trade secret, it is known that it depends on the direct hydration of ethylene. Five U. S. Treasury Department men maintain a constant guard over the finished product of the ethyl alcohol plant.

Another plant which is the result of research and development work carried out by Shell chemists is the ethyl chloride plant. The process utilizes ethylene, one of the several olefins available from refining operations, as its raw material, along with hydrochloric acid.

The butadiene plant was still another operation based on a process developed by research scientists at the Shell Development Co. laboratories at Emeryville, Calif. The company played an active part in the initial production of synthetic rubber by supplying sizable quantities from its pilot plant for use by rubber manufacturers in their pilot-plant operations.

The capacity of the isopropyl alcohol plant was doubled as part of the expansion program. In addition to its commercial uses (see table) isopropyl alcohol is used for conversion to other chemicals, notably acetone. An investment of more than $2,000,000 was necessary for the plants producing methyl isobutyl ketone and methyl isobutyl carbinol.

For obvious reasons, Shell has not yet disclosed processing details on a major portion of the products produced by the Houston plant. However, three of them—allyl chloride, allyl alcohol, and acrolein—have been



View of completely air conditioned administration building at Shell Chemical's Houston plant. This building houses administrative, engineering, technological personnel, and operating department offices, as well as the laboratories

covered in detail in the literature.

Allyl chloride is manufactured by the noncatalytic chlorination of propylene. The manufacture of allyl alcohol is accomplished by hydrolysis of allyl chloride and a small percentage of diallyl ether is produced.

An interesting sidelight on the chemical plant is the $500,000 waste-neutralizing and disposal plant. A special sewage system picks up waste water from all chemical operations at the plant and carries it at a maximum rate of 5,000 g.p.m. to the effluent treating unit. Here in a hexagonal tank built of vitrified tile, the waste is chemically treated to remove certain harmful impurities. It is then pumped into one of two 180,000-gal. settling basins, each 20 by 100 ft. Heavy materials, as they settle, are pumped out of the bottom of the tanks into burning pits. Lighter material rising to the top can be skimmed off and stored or burned. Thus rid of its impurities, the water is ready for disposal.

A generalized diagram showing the basic starting materials and finished products of the 16 plants comprising the one big chemical manufacturing center is combined with the aerial photograph of the plant at the beginning of this article.

B. M. DOWNEY
Plant manager

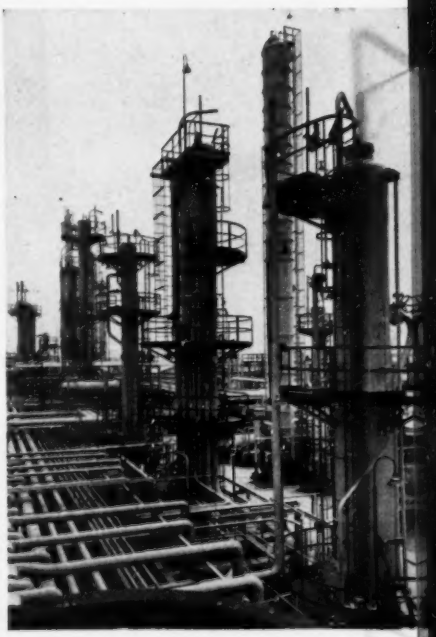
F. E. CADDY
Plant superintendent

J. F. McGARRY
Asst. plant superintendent

H. I. WOLFF
Chief technologist

V. W. WILSON
Chief chemist

H. Q. DUGURD
Chief engineer



Partial view of ethyl chloride plant at Shell's new works

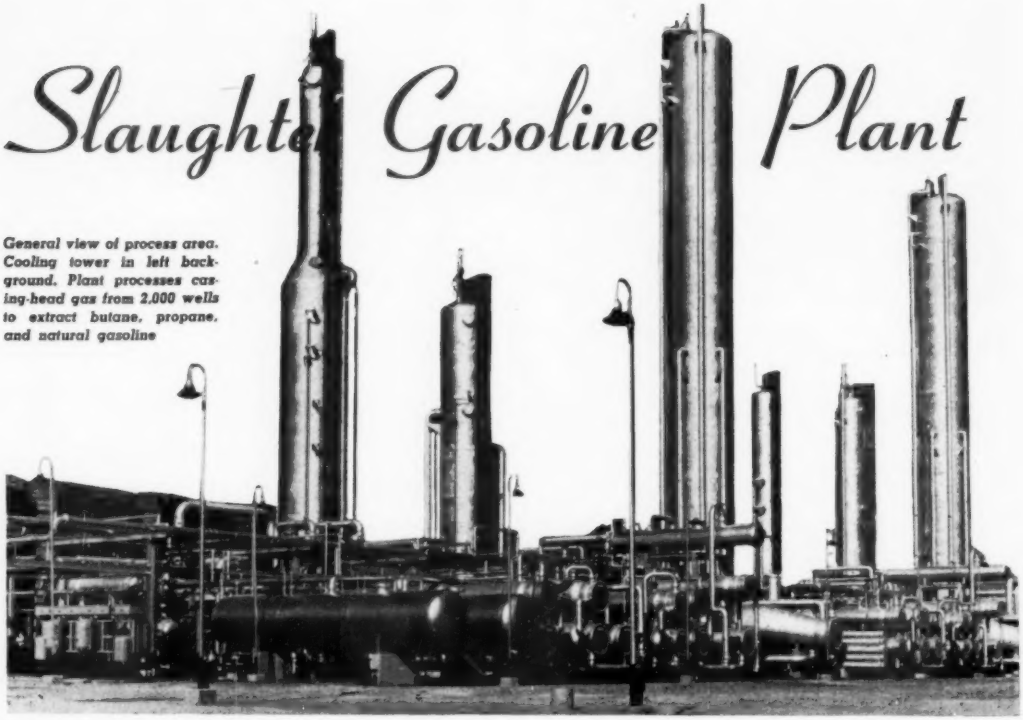
Houston Plant Largest

Shell Chemical Corp. is a wholly owned subsidiary of Shell Oil Co., Inc. The home office of Shell Chemical is in New York and manufacturing plants are operated at Dominguez, Martinez, and Pittsburg in California in addition to the Houston plant. The Houston plant, however, is by far the largest chemical plant in the Shell group.

The operation of the various plants is supervised by their respective man-

(Continued on page 108)

Slaughter Gasoline Plant



General view of process area. Cooling tower in left background. Plant processes casing-head gas from 2,000 wells to extract butane, propane, and natural gasoline

OUTSTANDING EXAMPLE OF COOPERATION

. . . in which eight companies unite in order to obtain the maximum utilization of natural gas

by J. S. Bellah,* R. U. Mertz,* and J. W. Kilmer*

ONE of the world's largest high-pressure casing-head-gasoline plants recently went into operation in Slaughter field of West Texas. This plant is an outstanding example of cooperation by a group of companies to secure economically the maximum utilization of natural resources.

Eight companies are joint owners in this venture. They are Stanolind Oil & Gas Co., The Texas Co., Honolulu Oil Corp., Magnolia Petroleum Co., Devonian Oil Co., Atlantic Refining Co., Saltmount Oil Co. and Mid-Continent Petroleum Corp. Although Stanolind is the largest owner in the plant, and is the operator, its participation is only a little more than 25 per cent.

Slaughter field lies in Cochran, Hockley, and Terry counties in West Texas. The discovery well was drilled in 1936 and opened up what turned out to be the third largest oil field, in acreage, in the United States. The field as presently developed contains some 75,000 acres, is approximately 15 miles long and 10 miles wide, with the longer axis lying generally in an east-west direction. There are now approximately 2,000 wells producing from the San Andres limestone at an average depth of 4,900 ft. The 1948 crude production was approximately 19,700,000 bbl. Slaughter crude is black, sour, and has an A.P.I. gravity of 34°.

Over 97 per cent of the oil-producing wells in the field are connected to the gasoline-plant gathering system. The Slaughter Gasoline plant is located in Hockley County approximately 12 miles southwest of Levelland. The plant is designed to process ultimately 120,000,000 standard cubic feet per day, although equipment is installed initially to process 90,000,000 cu. ft. The increased capacity can be attained in the future by the addition of a relatively small amount of equipment.

Design recovery of liquid products, when processing 90,000,000 cu. ft. of gas per day having the composition shown below, is approximately 50,000 gal. per day of propane, 92,000 gal. per day of butanes, and 100,000 gal. per day of debutanized gasoline.

DESIGN GAS COMPOSITION

Component—	Mol %
Hydrogen sulfide	*1.0
Carbon dioxide	†5.9
Nitrogen	10.4
Methane	59.3
Ethane	10.5
Propane	6.4
Butanes	3.7
Pentanes	1.7
Hexanes and heavier	1.1
	100.0

*Hydrogen sulfide may range up to 1.5 per cent. †Carbon dioxide may range up to 7.5 per cent.

*Stanolind Oil & Gas Co., Tulsa.

All residue gas except that used for plant and lease fuel is being sold to El Paso Natural Gas Co.

The plant incorporates a number of interesting process and mechanical features, including (1) a "split flow" Girbotol unit to sweeten the field gas, (2) a fractionating reabsorber designed to deethanize the rich oil, making it practical to operate with only one stripping still and eliminating necessity for a separate deethanizer, and (3) an indirect heating system, employing oil as a heat medium, which supplies about 90 per cent of the process heating load, thus reducing the size of the steam plant.

The plant is designed to recover 32 per cent of the propane, 85 per cent of the butanes, and 99 per cent of the pentanes and heavier content of the wet field gas. Design recovery was set at the maximum possible consistent with heating value specifications of the residue gas.

Field System

The field-gas gathering system is designed to collect gas from field separators operating at approximately 10 psig., delivering it to the gasoline plant at a pressure slightly above atmospheric. The entire gathering system is designed to operate above atmospheric pressure in order to eliminate the possibility of air infiltration which would be undesirable because of the hydrogen sulfide content of the gas. The system consists of seven main lines with branch lines connecting to the well batteries. This gas-gathering system, one of the largest of its kind, contains approximately 200 miles of pipe ranging from 2 to 30 in. in diameter. The field system also includes a residue gas system to return dry sweet gas to all leases.

Field-Gas Compressors

The plant field-gas compressors (Fig. 1) consist of sixteen 1,600-hp. (sea-level rating) two-cycle, right-angle, gas-engine-driven units designed to compress approximately 90,000,000 cu. ft. per day from 13.2 to 713 psia. Each machine is equipped with three stages of compression designed with sufficient flexibility to compress 10 per cent additional gas by an increase in suction pressure to 18.2 psia. These compressors are derated to approximately 1,500 b.p.h each at the 3,000-ft. altitude of the plant location.

Field gas enters the plant through a 12 by 40-ft. horizontal scrubber designed to remove entrained crude oil, scale, and other foreign material. Gas from this scrubber flows to the compressor first-stage suction header at essentially atmospheric pressure, and is compressed through two stages to approximately 180 psig. The second-stage discharge gas is cooled, passed through a separator, and flows to the hydrogen sulfide-removal system where H_2S and CO_2 are removed by

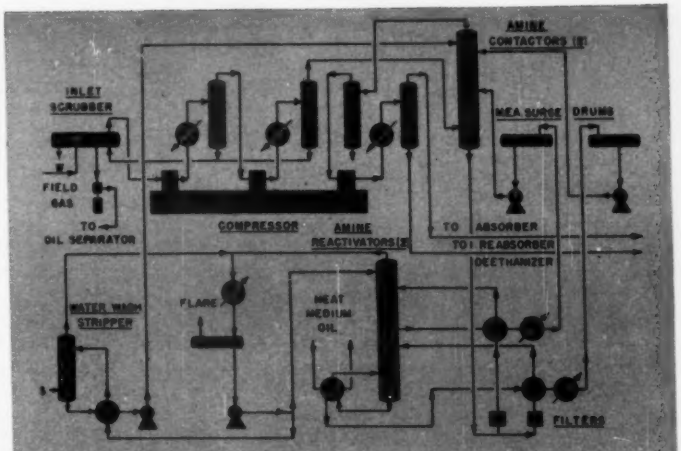


Fig. 1—Flow diagram of compression and H_2S removal

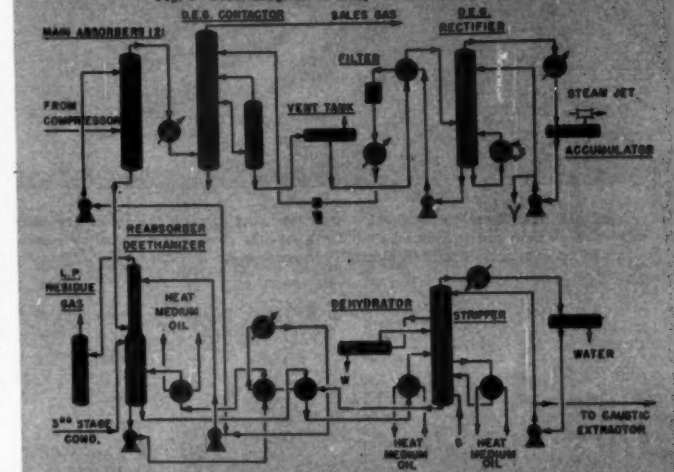


Fig. 2—Flow diagram of absorption and distillation

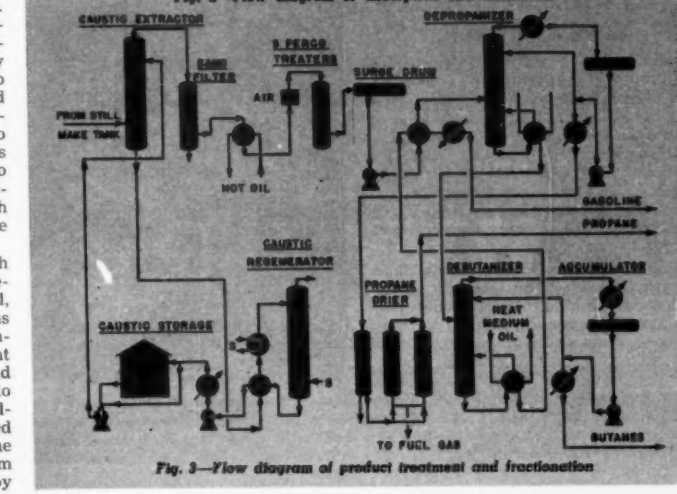
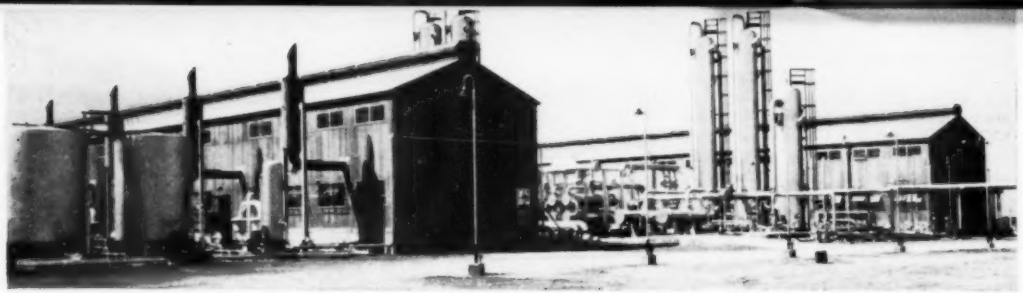
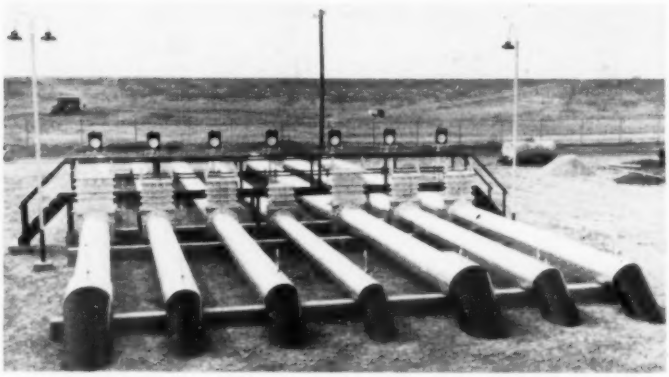


Fig. 3—Flow diagram of product treatment and fractionation



General view of plant, showing compressor building and fractionating equipment



Casing-head gas from Slaughter field enters gasoline plant through the seven big lines shown here, where the gas is metered as it flows into the plant. Field gathering system has 200 miles of pipe (2 to 30-in. diameter), is designed for 120 M.M.c.f. per day

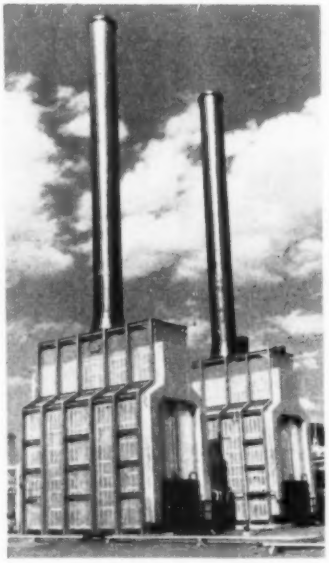
contacting with a water solution of monoethanolamine. Sweet gas from the amine contactors passed through residue scrubbers, enters the third stage of compression at approximately 165 psig., and is compressed to 700 psig., the operating pressure of the main absorber.

Future addition of four 1,600-hp. compressors will increase the plant capacity to 120,000,000 cu. ft. per day.

H_2S-Removal System

A flow diagram of the H_2S removal system is indicated in Fig. 1. Because of the relatively high content of acid gas (H_2S and CO_2) a "split flow" Girbotol amine system was installed. This system, by utilizing partially stripped monoethanolamine for removal of a large proportion of the acid gas, effects economy in utilities consumption over the conventional amine system.

Sour field gas from the second stage of compression after cooling is divided and processed in two independent parallel amine systems, each designed to sweeten a maximum of 60,000,000 cu. ft. per day. Each of the 28-tray contactors is 9 by 65 ft. and normally operates at 175 psig. Gas leaving the contractors is essentially free of CO_2 and is negative to the lead acetate test for H_2S. When processing 90,000,000 cu. ft. per day of sour field gas, the total circulation of 30 per cent monoethanolamine for both amine systems is some 1,100 g.p.m.



Heat-medium furnaces of the plant. Most of the heat for processing is carried by a "heat medium," a special type of oil that is heated in these furnaces and then circulated about plant

In this split flow process, a portion of the total rich amine stream is completely stripped and returned to the top of the contactor. The other portion, only partially stripped, is returned to the contactor on either the sixteenth or twelfth tray from the bottom. The rich amine is split and introduced into the reactivator at two points. That portion flowing down the top half of the reactivator is only partially stripped, while the portion flowing down the bottom half is essentially completely stripped. Details of the cycle are shown in the flow diagram, Fig. 1.

In this process a major portion of the acid-gas content of the field is removed by partially stripped amine solution, and further reduction to lead acetate quality is assured by final contacting with completely stripped solution. Elimination of the necessity of completely stripping the entire amine circulation results in substantial reduction of utilities consumption.

Each of the two reactivators is 8 ft. 6 in. by 80 ft. 10½ in. and is equipped with 33 bubble-cap trays, the seventeenth tray from the bottom being a chimney tray.

Overhead vapor from the reactivator, consisting of acid gas and steam, passes through an overhead cooler which serves to condense the major portion of the steam. Part of this condensate is returned to the reactivator top tray as reflux, and the remaining portion is stripped of acid gas and pumped over wash trays in the tops of the contactors to minimize loss of amine to residue gas. Acid gas from the reactivator reflux accumulator flows to a flare line.

Absorption and Distillation System

Sweet rich gas from the third-stage discharge scrubber enters two 6-ft. 6-in. by 46-ft. main absorbers, each containing 25 trays. Normal operating pressure is 693 psig. Design lean-oil circulation over the main absorbers, for a 90,000,000-cu.-ft.-per-day processing rate, is 585 g.p.m. The combined residue gas goes to a single diethylene glycol unit for dehydration. Rich oil from the bottom of the absorbers, along with condensate

Never too Rugged
For deep well drilling, you can depend on Youngstown Oil Country Tubular Goods. Through nearly half a century, it has been setting records for excellent performance--in tough operations, as well as in normal service.
QUALITY
YOUNGSTOWN
SERVICE
Youngstown
OIL COUNTRY TUBULAR GOODS

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices — Youngstown 1, Ohio

Export Office - 500 Fifth Avenue, New York

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - TIE PLATES AND SPIKES.

Choose YOUNG-HAPPY *Coolers*

for Your cooling application....

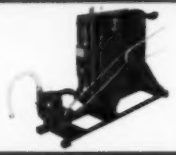
● Economical cooling demands the right sized equipment for the job.

YOUNG-HAPPY offers an economical range of types and sizes

for

Jacket Water
Gas Cooling
Oil Cooling
Steam Condensing
Process Cooling

Standard Series (In Stock)	6 sizes
Master Series (In Stock)	4 sizes
H-C Series (Horizontal Coil)	8 sizes
VAD Series (Vertical Air Discharge)	3 sizes



STANDARD SERIES

MASTER SERIES

H-C SERIES

VAD SERIES

SERVING FOR...

Industrial Hose
Happy Coolers
Rubber Belting
Leather Belting
V Belts
V Belt Sheaves
P & H Engine Starters
Safety Switches
Happy Pumping Units
Power Transmission Equipment

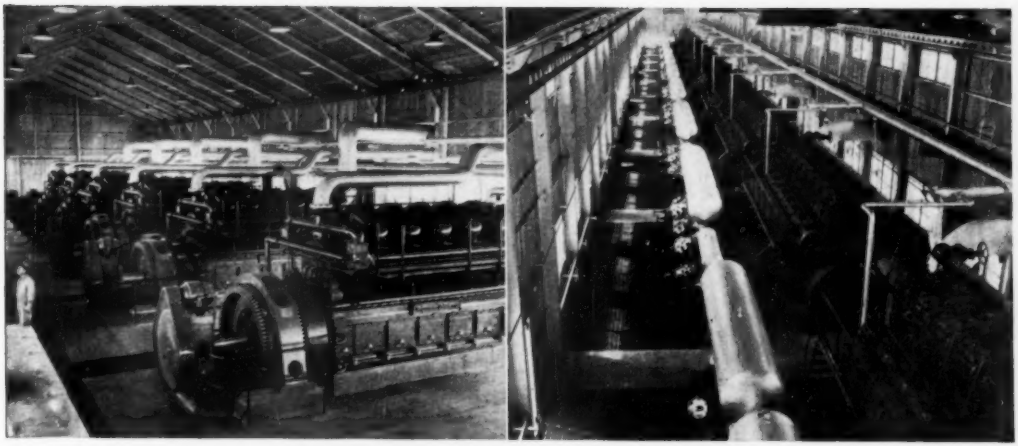
The **HAPPY COMPANY**

Formerly HAPPY BELTING COMPANY
TULSA, OKLAHOMA

30 HAPPY YEARS

BRANCH OFFICES:

Seminole	Oklahoma
Smackover	Arkansas
Odessa	Texas
Kilgore	Texas
Pampa	Texas
Wichita Falls	Texas
Salem	Illinois
Wichita	Kansas
Ellinwood	Kansas



Left: Interior view of generator house, showing Wesley Curry, electrical foreman at Switchboard. Electric power is supplied by six 800-kw., 2,300-volt generators. Right: Interior view of north compressor house. Plant has sixteen 1,600-hp. compressors, of which 10 are in the north building. Compressors total 25,600 hp.

from the third-stage scrubber, flows to the reabsorber deethanizer, operated at 137 psig.

The reabsorber deethanizer is equipped with 45 bubble-cap trays, 25 in the 10-ft. 6-in. by 53-ft. stripping section and 20 in the 5 by 32-ft. absorption section. Rich oil from the main absorber, together with third-stage condensate, enters on the twenty-fifth tray. Part of the lighter absorbed hydrocarbons flash and rise through the tower while the remaining rich oil flows down to the bottom of the stripping section. Rich oil from the bottom tray of the stripping section is reboiled by pumping through heat exchangers and is flashed back into a separate compartment in the bottom of the tower. Deethanized rich oil flows from this compartment to the rich-oil still.

Flashed vapors rise through the stripping section countercurrent to the descending rich oil, effectively removing ethane and methane. Vapor from the stripping section, together with flashed vapor from the feed, enters the 20-tray absorption section where propane and butane loss to the residue gas is controlled by introduction of lean oil to the top tray at a design rate of 155 g.p.m. Residue gas from the reabsorber deethanizer is used as plant fuel.

Deethanized rich-oil exchanges heat with stripped lean oil, is further heated by heat medium oil to 400° F., and enters the rich-oil stripper (still) on the twelfth tray from the bottom.

The stripper, 9 ft. 6 in. by 61 ft. 6 in., is equipped with 20 trays. The normal operating pressure is 67 psig. Partially stripped rich oil is withdrawn from the eleventh tray of the tower, passes through a reheater, and is returned to the tenth tray at 485° F. This oil passes down through the stripping section of the still countercurrent to stripping steam which is introduced to the bottom of the still at a design rate of 9,000 lb. per hour. Flashed vapors from the feed, together with stripped vapors from the stripping section, enter the upper or fractionating section of the still where lean oil is washed back by reflux returned to the top tray at a design rate of 230 g.p.m. Since the rich oil feed to the still is substantially deethanized, the still overhead is normally completely condensed. The overhead make from the still, consisting of propane, butanes and natural gasoline, is pumped through the product treating system to the fractionators.

Hot lean oil from the bottom of the stripper is heat exchanged against the rich-oil feed and against the reabsorber deethanizer reboiler stream. The lean oil is finally cooled with water to 85° F. and pumped back to the main absorber and reabsorber. (See Fig. 2).

Residue Gas Dehydration

Cooled residue gas from the main absorbers is dried by contact with 97-98 weight per cent diethylene glycol in a 6-ft. 6-in. by 30-ft. 1-in. seven-tray contactor. (See Fig. 2). The bottom section of this contactor serves as a knock out drum. Normal operating pressure is 688 psig.

Diethylene glycol solution flows from a chimney tray in the contactor through a small level control drum to the diethylene glycol rectifier. The diethylene glycol rectifier is 6 ft. 6 in. by 31 ft. and contains 12 bubble-cap trays.

In order to permit operation with maximum water dew-point depression, provision is made for reconcentration of diluted diethylene glycol by vacuum distillation at 8-9 psia. By this method of operation, diethylene glycol concentrations of 97-98 weight per cent may be attained without danger of decomposition.

Concentrated diethylene glycol from the bottom of the rectifier is cooled and returned to the top of the contactor. Design circulation rate when processing 90,000,000 cu. ft. per day is approximately 10 g.p.m.

Liquid Product Treating

The high mercaptan sulfur content of Slaughter field gas makes it impractical to treat the gasoline in a conventional stationary-bed copper chloride treater without pretreatment to reduce the mercaptan content. In the Slaughter plant, a regenerative caustic washing system serves this purpose. (See Fig. 3). The raw gasoline stream from the still overhead accumulator is pumped through a 6 by 50-ft. packed caustic contactor containing 30 ft. of 1½-in. carbon raschig rings. When operating at a processing rate of 90,000,000 cu. ft. per day the design solution circulation is 35 g.p.m. of 10 per cent sodium hydroxide solution. This caustic circulation reduces the mercaptain sulfur content of the raw gasoline to a point where it is satisfactorily treated in fixed-bed copper chloride treaters. Spent caustic from the bottom of the caustic contactor is regenerated by steam stripping in a 5-ft. by 22-ft. 6-in. tower equipped with eight bubble-cap trays. The overhead from the caustic regenerator tower, consisting of steam and mercaptans, flows to a disposal stack.

Raw gasoline from the caustic contactor passes through sand filters for removal of caustic entrainment and into five fixed-bed copper chloride contactors, each 72 in. by 12 ft., operating in parallel. This treatment converts the remaining mercaptan sulfur

(Continued on page 110)

Completing an oil well the American (rubber) way

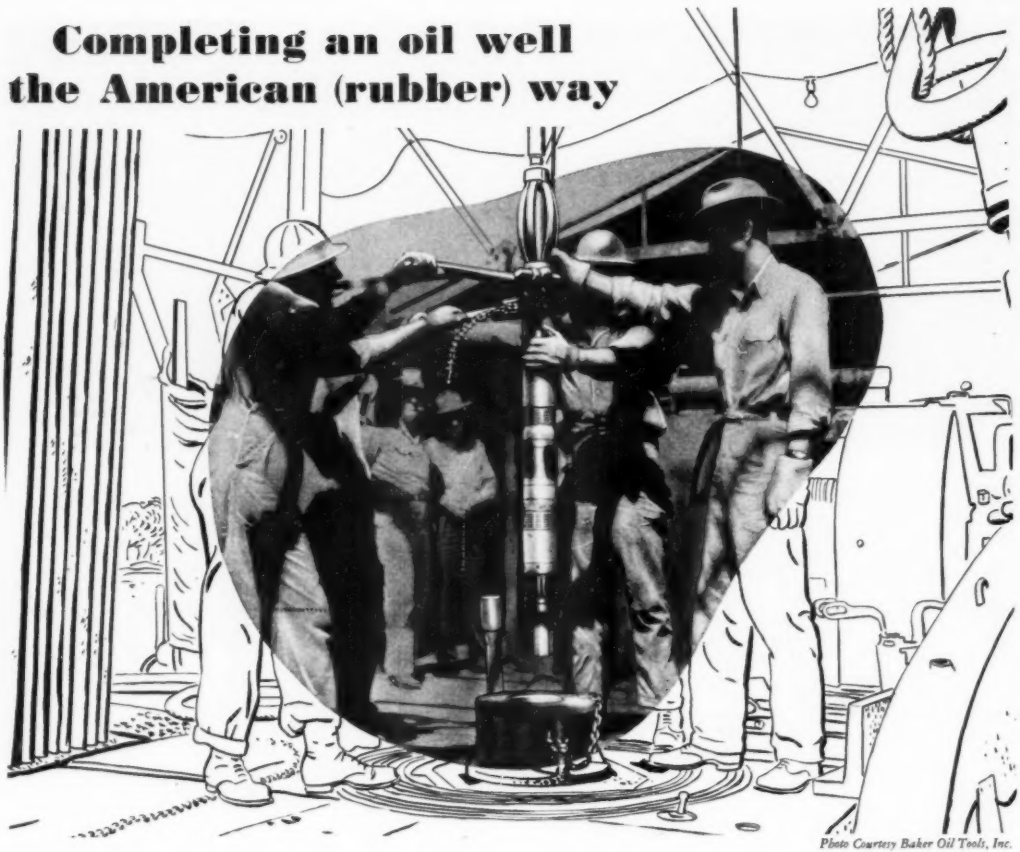


Photo Courtesy Baker Oil Tools, Inc.

Versatile HYCAR American Rubber an important material in oil fields, too

THE dark ring you see in the center of that oil tool plays a big part in getting the well ready to produce gas and oil. (In the oil field it's called "completing" the well.) It's a sealing ring that has to stand the high pressures and temperatures found in deep wells—has to stand the corrosive action of the gas, the swelling and deteriorating action of hot oil until the well is exhausted.

It does all these things—perfectly—because it's made from HYCAR American rubber.

In home and industry HYCAR has proved an important and versatile material because it imparts to finished products all the properties mentioned above, and many more. For example, brightly colored kitchen drain mats resist grease, food acids and alkalis, heat and cold, aging. Shower curtains resist water as well as all these other factors.

Latices of HYCAR may be used as impregnants or coatings for textiles, papers and leathers—or as adhesives in a broad range of uses. The list of applications grows longer every day.

Hycar American rubber is just one product of B. F. Goodrich Chemical Company. Others are GEON polyvinyl resins, and GOOD-RITE chemicals and plasticizers. For information regarding any of these products and their end uses please write Dept. HE-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

Hycar
Reg. U. S. Pat. Off.
American Rubber

B. F. Goodrich Chemical Company
A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers

Hydraulic Fracturing of Oil And Gas Formations by the *Hydrafrac Process*

by J. B. Clark*

A SIMPLIFIED cross-section of a well treated by one version of the Hydrafrac process is given in Fig. 1. The first step, formation breakdown, is done with a viscous fluid, usually consisting of an oil such as crude oil or gasoline, to which has been added a bodying agent. Due to availability and price, war-surplus Napalm has been used in the majority of experiments to date. Napalm is the soap which was used in the war to make "jellied gasoline." The next step consists of breaking down the viscosity of the gel, for example, by injecting a gel-breaker solution and then after several hours, putting the well back on production.

In a typical field hookup, the oil or gasoline is unloaded into a 10-bbl. tank mounted on the rear of truck. This base fluid is picked up by the mixing pump and pumped through the jet mixer, where the granular soap is added. Next it goes into a small mixing tub, from which the high-pressure pump takes suction. The solution is then pumped into the well. The breaker solution is then taken from an extra tank and is displaced into the well immediately following the gel. When required, additional trucks may be connected to the well so as to pump the fluids at a faster rate.

*Stanolind Oil & Gas Co., Tulsa.

PROCESS INCREASES WELL PRODUCTIVITY

The new development of hydraulically fracturing a productive formation to increase its permeability is known as the "Hydrafrac" process. As it is now being used, the process consists of two steps: (1) Injecting a viscous liquid which may contain a granular material such as sand for a propping agent, under high hydraulic pressure to fracture or extend a fracture in a formation; (2) causing the viscous liquid to change from a high to a low viscosity so that it may be readily displaced from the fracture.

The field application of this process definitely indicates that Hydrafrac is capable of increasing well productivity. This is evidenced by sustained production increases in 12 of the 24 wells in 7 fields treated by this process. Future use of the Hydrafrac process also is contemplated in connection with water and gas injection wells on secondary recovery work.

The Oil and Gas Journal published the first article on the Hydrafrac process in its issue of October 14, 1948 (by J. B. Clark). The material given here is from the A.P.I.-Pittsburgh meeting, April 28-29, 1949, and gives some additional information over the original Journal article.

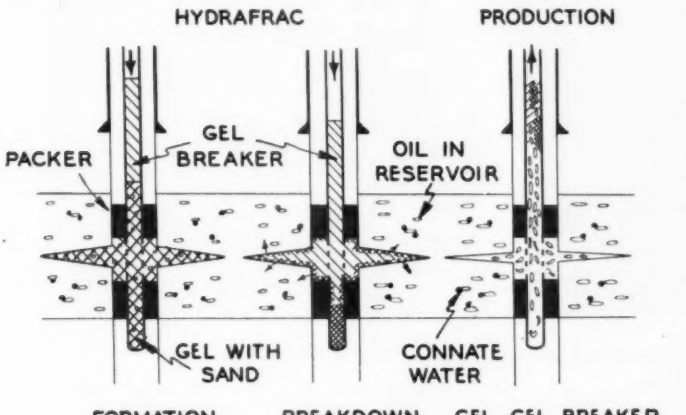


Fig. 1—Steps in the Hydrafrac process are shown here from left to right. The fracturing fluid is forced into the producing formation, followed by the gel breaker. Upon release of pressure, the breaker and fracturing fluid are produced from the well, the fractures being held open by solid material

Planning a Field Job

Planning of a Hydrafrac job requires detailed consideration of the individual well conditions. Selection of the pumps and of the kind and amount of hydraulic fluid, for example, depends upon the thickness and permeability of exposed producing formation; the bottom-hole formation pressure; the well depth; the pipe size and condition; and upon the weight, strength, and compressibility of the overburden.

Individual items that must be considered in the planning, and the method of meeting the detailed requirements for the fracturing fluid and equipment are discussed in detail below.

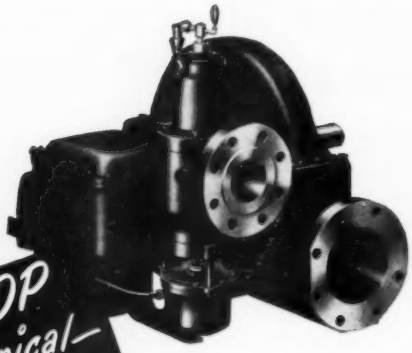
Selecting a Well for Hydrafrac Treatment

In order to reach a decision as to whether a particular well is suitable for the Hydrafrac treatment, a number of factors must be considered. These factors are interrelated to a great extent. In time it is to be expected that experience will provide enough field data so that this problem can be substantially reduced to formulas. To date certain methods of computation have been applied to this problem and there is some evidence as to the validity of these methods.

The more important factors to be considered are as follows:

1. **Formation permeability.** — The Hydrafrac process can be adapted to any formation permeability by choosing a treating fluid of the proper viscosity, together with appropriate pump capacity. For a given pump capacity, the greater the formation permeability, the higher must be the viscosity of the treating fluid.

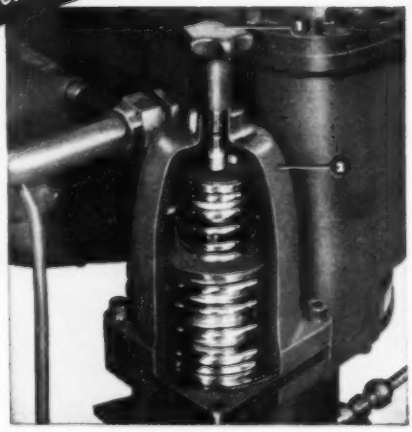
2. **Formation thickness.** — The exposed thickness and uniformity of the



GE Type DP Mechanical-Drive Turbine

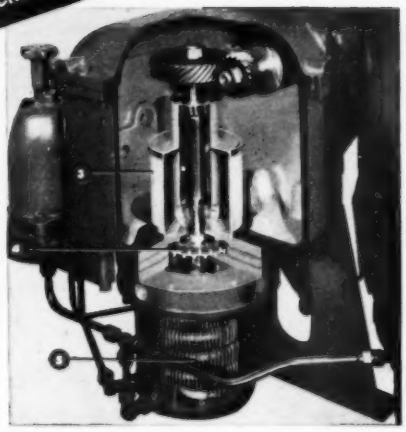
LOOK AT THESE

Better Governing



1. **30% ADJUSTABLE SPEED RANGE** is wider than obtainable with mechanical governors.
2. **RELIABILITY** even after long standby assured by totally enclosed, continuously lubricated hydraulic governor.

Better Lubrication



3. **CLEAN OIL** maintained by bronze mesh oil strainer.
4. **POSITIVE PRESSURE** furnished by turbine-type oil pump.
5. **ADEQUATE OIL COOLING** provided by high-capacity fin-tube oil cooler.

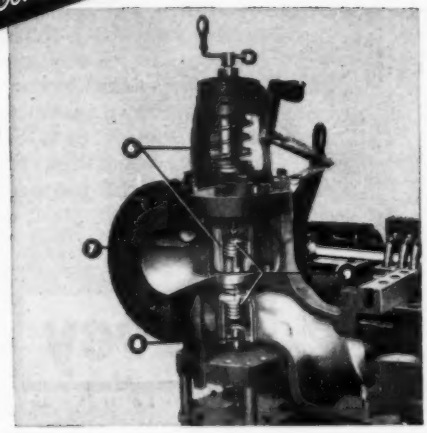
SPECIAL FEATURES

—AT NO EXTRA COST

YOU get a host of special features in the Type DP line of mechanical-drive turbines—features which provide better governing, lubrication, valving, and less maintenance than previous standard units. These features, formerly obtainable only on costlier "special" machines, are standard on the DP—at no extra cost.

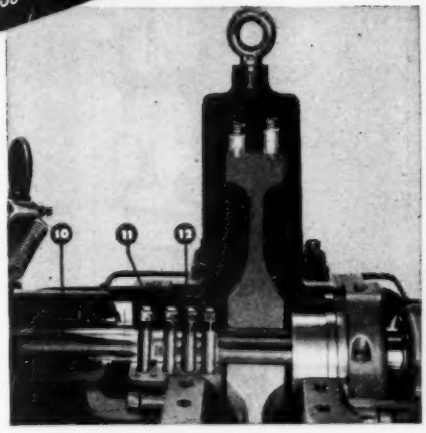
If you have a turbine application, be sure to investigate the time and trouble-saving features of the DP. Your G-E representative will be glad to give you all the facts. Apparatus Department, General Electric Company, Schenectady 5, New York.

Better Valving



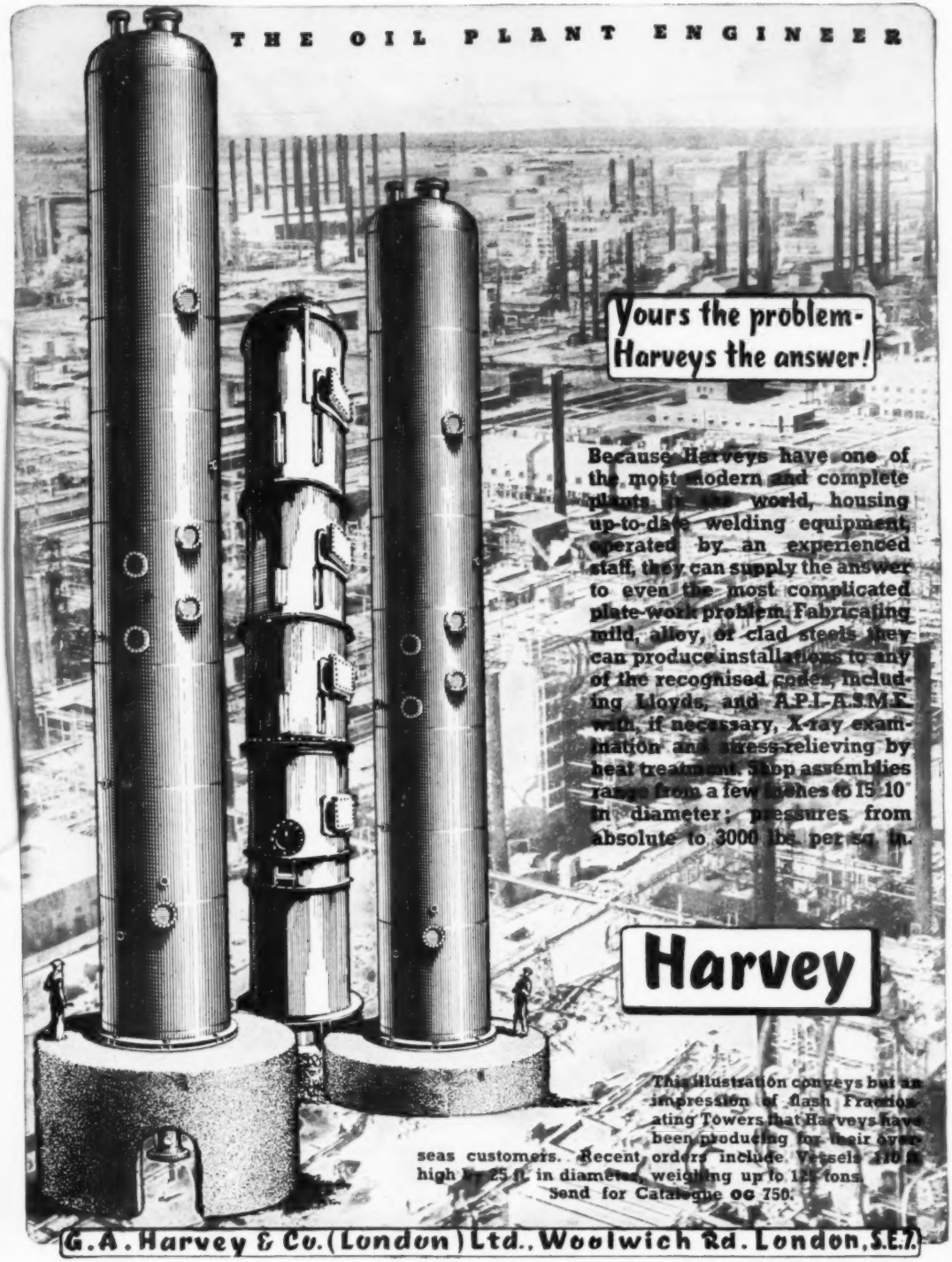
7. LONG LASTING heavy Monel steam strainer.
8. MAINTENANCE REDUCED by valve stem sealing bushings—no soft packings required.
9. EASY ONE-HAND OPERATION with balanced valve design.

Less Maintenance



10. LONG BEARING LIFE assured by solid-backed bearings.
11. SHAFT EROSION PREVENTED by Monel spray under packings.
12. STEAM LEAKAGE sealed off by heavy double-seal carbon packings.

GENERAL ELECTRIC



Yours the problem- Harveys the answer!

Because Harveys have one of the most modern and complete plants in the world, housing up-to-date welding equipment, operated by an experienced staff, they can supply the answer to even the most complicated plate-work problem. Fabricating mild, alloy, or clad steels they can produce installations to any of the recognised codes, including Lloyds, and A.P.I.-A.S.M.E. with, if necessary, X-ray examination and stress-relieving by heat treatment. Shop assemblies range from a few inches to 15' 10" in diameter; pressures from absolute to 3000 lbs. per sq. in.

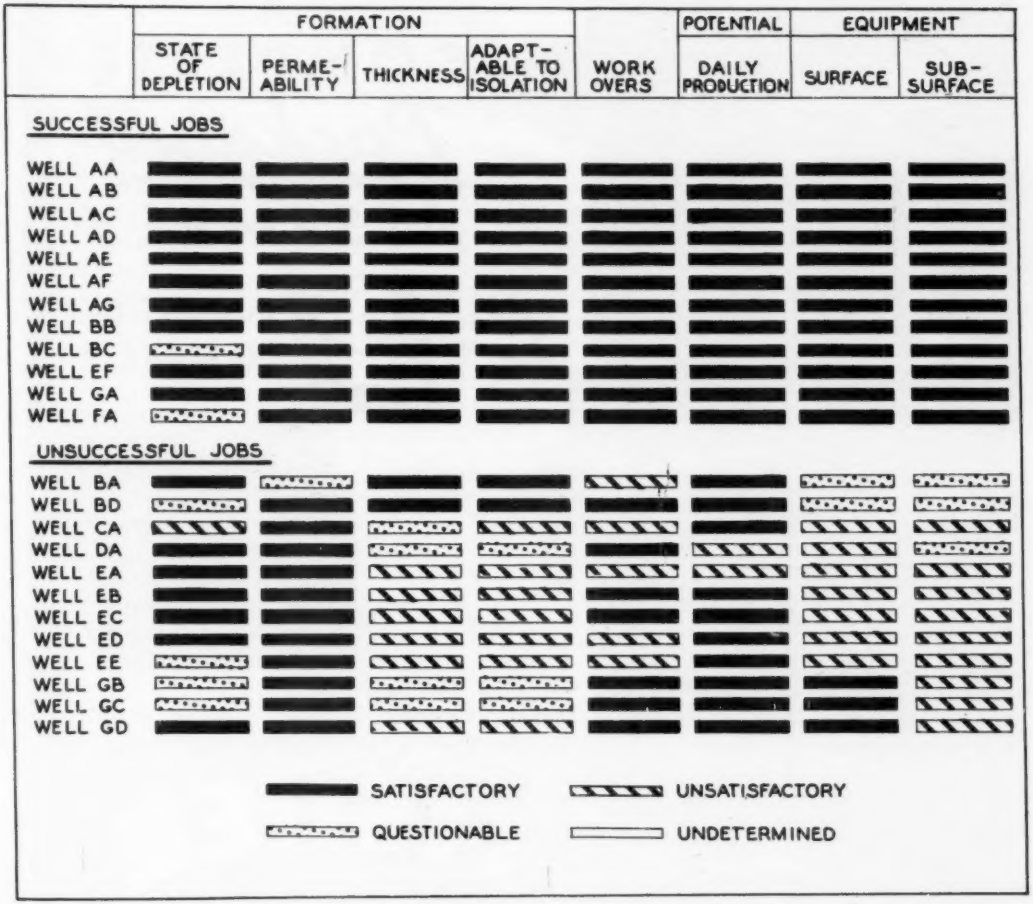
Harvey

This illustration conveys but an impression of flash Fractionating Towers that Harveys have been producing for their overseas customers. Recent orders include Vessels 110 ft. high by 25 ft. in diameter, weighing up to 125 tons.

Send for Catalogue OC 750.

G. A. Harvey & Co. (London) Ltd., Woolwich Rd. London, S.E.7.

Table 1—Pre-Hydrafrac Well-Evaluation Chart



pay formation, when considered along with the permeability and the treating fluid viscosity, determines whether or not special means must be taken to isolate portions of the formation for treatment.

3. **Adaptability of the zone to isolation.**—The success of this process often depends to a great extent on the ability to set open-hole packers so as to isolate portions of the formation for separate treatment. Consideration must be given then to the contour of the open-hole section, the competence of the formations, and to any mechanical problems which might influence the success of open-hole packer setting.

4. **Prior workovers.**—Any prior workover that has fractured the producing formation may limit the effectiveness of Hydrafrac. In some cases, however, it may be possible to improve an earlier fracturing job by extending fractures already present.

5. **Isolation of formation behind casing.**—When treating through perforations in casing, the success of treatment may depend on the quality of the cement job, as the ability to isolate is directly dependent on this factor. When considering this type of treatment, a check should also be made of the ability of the casing to withstand the expected treating pressures. Little trouble has been experienced in obtaining packers to isolate any desired section in the casing.

6. **Pump capacity.**—Of course it is absolutely necessary to have on hand for one of these jobs, pumps which will handle the necessary volumes at discharge pressures high enough to create and to extend the fracture, otherwise there is risk of wasting the special treating fluids without achieving the desired results.

To illustrate the importance of the above factors, all of the wells that have been Hydrafrac treated to date have been reanalyzed in an effort to determine the reason for success or failure. The results of this analysis are given below in Table 1. Surface equipment has been added as another factor to be considered, because in the early stages of the development of this process, inadequate surface pump equipment was used on many jobs. It should be noted, however, that where the factors listed above were found to be satisfactory, a successful treatment was accomplished.

The question of quantity of treating fluids will continue to be under experimental investigation for some time. To date, quantities in field jobs have ranged between 500 and 5,000 gal. of viscous fracturing fluid followed by an amount of gel-breaker solution equal to twice the volume of fracturing fluid used. The majority

A
COMPLETE
Packaged
ASSEMBLY
ONLY 2 CONNECTIONS TO MAKE
Operating Medium Supply Connection
Instrument Air Connection
FISHER
DIAPHRAGM
MOTOR VALVE
It's "factory piped". Fisher is bolted to yoke with two cap screw bolts.
Fisher Diaphragm Motor Valve Top Works are now regularly equipped with mounting pads for auxiliary units such as filter and positioner.
FISHER GOVERNOR COMPANY
MARSHALLTOWN, IOWA

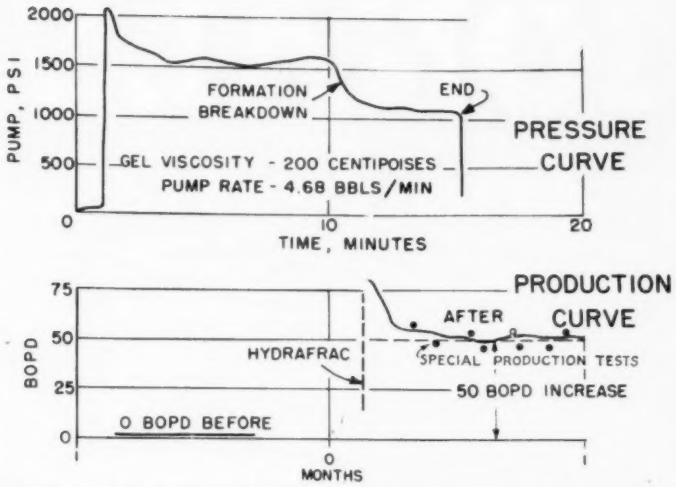


Fig. 2—Illustration of the rate of pressure increase and decrease upon formation breakdown is given here. Also shown is the effect of the fracturing operation on oil production

of jobs to date have been done with 1,000 gal. viscous fluid followed by 2,000 gal. of gel breaker solution.

Hydraulic Base Fluids

The ideal fluid should be an oily one rather than a water base fluid, to avoid decreasing the permeability of the formation to oil or gas. This requirement is met by the Napalm gel being used. Water-base fluids, however, would be advantageous in treating water wells, or water-injection wells used in either the oil industry or industries where water is used in solution mining of salts, and in the Frasch process of mining sulfur. There is also some reason to believe that a water-base fluid could be used successfully in oil or gas wells.

Breaking the fracturing fluid viscosity.—After the fracture is made, the fracturing fluid must be thin enough to flow back out of the well. The Papalm gels have the advantage of being relatively unstable, so that the viscosity of the solution will revert to approximately that of the base oil after the fracture is formed.

Pump Requirements

Field experience has shown that there is a definite relation between successful formation fracturing and achievement of a sharp or at least moderately sharp, pressure drop during the initial part of the treating operation. This is demonstrated on accompanying charts. However, one variation of the treatment may involve extension of a fracture already present, rather than formation of a new fracture. In such a case it might be expected that improved productivity would result, even though no abrupt pressure break is experienced during the injection of the treating fluids.

As was previously mentioned, it is possible to estimate by methods of computation which are partially proved in practice, the minimum viscosity of fluid necessary to fracture a formation and to extend the fracture when using any given pump capacity, and it is also possible to estimate the pressure necessary to cause the initial fracture, and to extend it.

Table 2 compares calculated breakdown pressures with those observed in the field. A comparison of the data presented in this table indicates a close agreement between the two figures.

TABLE 2—CALCULATED VS. ACTUAL FORMATION BREAKDOWN PRESSURES

		Bottom-hole pressure, psi.	
		Calculated	
Field—	Well		Actual
East Texas	GA	3,000	3,350
Rangely, Colorado	EF	4,800	4,900
Hugoton, Kansas	AA	2,500	2,000
East Sasakwa, Okla.	FA	2,600	2,400
Frannie, Wyoming	BB	2,700	2,750

Table 3 illustrates typical results of computations of pump rates, viscosities, etc. It is apparent from this table that, in formations of normal permeability, it is impossible to employ a fluid of high penetrating ability, such as the usual low-viscosity crude oil, for fracturing or extending the fracture. However, it is obvious from Table 3 that by using a higher-viscosity material such as a 100-cp. gel, the pump requirements are dropped to within practical limits both for fracturing and for extending the fracture. It is to be noted that these computed data are subject to further field confirmation and they are presented only to give a general comparison of the effects of some of the variables involved in the process.

Hazards.—The Hydrafrac process is accompanied by a considerable hazard to personnel. The materials usually used are inflammable and explosive, and this, together with the use of internal-combustion engines, makes this process rather hazardous. It is believed, however, that by exercising due caution such as covering mixing tubs and piping off engine exhausts, this process need not be more hazardous than the handling of any other inflammable liquid. The treating solutions have not ignited on any of the jobs done to date.

Field Results

The experimental application of the Hydrafrac process to oil and gas wells has resulted in sustained and significant increases in productivity on 12 wells out of the 24 in which it has been tried. A discussion of some of the results obtained on specific wells follows:

Hugoton field, Kansas.—Seven of the 12 successful jobs were on gas wells in Hugoton field. In one instance, a combination Hydrafrac-acid job was done, resulting in increasing deliverability from 53 to 439 M.c.f. per day; an increase from 53 to 322 M.c.f. per day was the result of the Hydrafrac treatment, with a further increase to 439 M.c.f. per day being the result of the subsequent acid job. On a Hydrafrac-treated well, the deliverability was increased from 0 to 258 M.c.f. per day, where the aver-

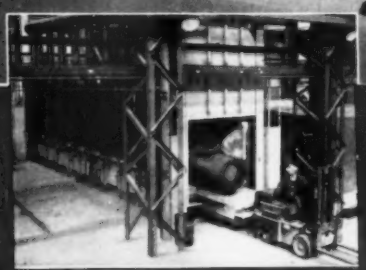
TABLE 3—PUMP RATE TO FRACTURE HYDRAULICALLY

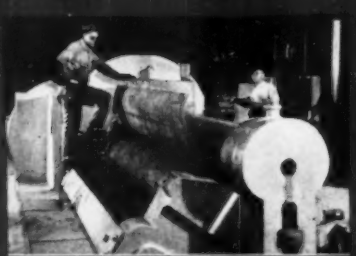
	E. Sasakwa field, Booch sand	Hugoton field, Ft. Riley lime	East Texas field, Woodbine sand
Amount of open hole, ft.	35	35	20
Average formation permeability, md.	150	13	2,000
Bbl./min. to fracture:			
Crude oil—5 cp.	2	.13	21
Gel—100 cp.	0.1	.007	1
Bbl./min. to extend fracture to 50-ft. radius:			
Crude oil—5 cp.	11	1	213
Gel—100 cp.	0.6	0.05	10.7
Pressure to fracture	*2,100	*1,700	*2,900
	†1,250	†900	†1,700
Pressure to extend fracture	*1,700	*1,350	*2,600
	†850	†550	†1,400

*Bottom-hole pressure (psi.). †Surface pressure (psi.).

NATIONAL'S

to the World's





ANSWER...
Petroleum Needs

Since the company was established in 1926, National Tank has devoted its services exclusively to the production end of the oil industry. National Tank Company is now in a position, through their greatly increased modern facilities, to serve the industry in a much broader way. The new facilities will now permit the manufacture of much larger and higher working pressure vessels for gasoline extraction, refining, gas processing, chemical processing and other lines, in addition to all their present products.

Engineering and design is an important part of the services offered. Experienced engineers and draftsmen, as well as shop and fabricating personnel, are available, with modern facilities to carry out such programs.

THESE NEW PRODUCTS WILL INCLUDE:

- FRACTIONATING COLUMNS
- REFINERY COLUMNS
- DEBUTANIZERS
- BUBBLE TOWERS
- CHEMICAL TANKS
- ABSORBER TOWERS
- DISTILLATION TOWERS
- DEPROPANIZERS
- VACUUM STILLS
- STABILIZER TOWERS

SPECIAL EQUIPMENT HAS BEEN INSTALLED TO INSURE QUICK DELIVERY OF ALL VESSELS:

- THREE 5-TON FLOOR CRANES
- FOUR 5-TON CAB TRAVELING CRANES
- SIX 10-TON CAB TRAVELING CRANES
- TWO 50-TON CAB TRAVELING CRANES
- 400-TON HYDRAULIC PRESS
- 10′ x 16′ HEAD AND PLATE FURNACE
- 7′ x 7′ x 40′ ANNEALING FURNACE
- 15′ x 15′ x 80′ ANNEALING FURNACE
- 2½″ CAPACITY PLATE BENDING ROLL
- X-RAY EQUIPMENT FOR PLATE UP TO 20″ THICK

The new plant, of more than 5 acres under one roof, is across the street from the present National Tank manufacturing site.
Inquiries for quick delivery are invited.

A color brochure has been prepared describing in detail this new plant, which is located on a 36½-acre site.
For your copy, please write

National Tank Company
TULSA, OKLAHOMA.

• MANUFACTURERS OF SPECIAL MILLWORK: DISTRIBUTORS OF CURTIS WOODWORK; JOHNS-MANVILLE BUILDING MATERIALS

• In order to keep pace with the rest of the industry in the production, refining and transporting of oil, modern equipment is necessary. It is probably possible for the oil industry to "get by" with old fashioned housing, but if workers are to be kept happy, and equipment properly protected, modern housing is just as necessary as modern equipment. Modernize your oil field camps with STURDYBILT, prefabricated demountable houses. We can give immediate delivery, and furnish any type of home or building you need. Investigate STURDY-BILT houses today. Write for complete information.

STURDYBILT

SOUTHERN MILL & MANUFACTURING CO.

• TULSA, OKLAHOMA •

Prefabricated, Demountable Houses

• STURDYBILT HOUSES COMPLY WITH COMMERCIAL STANDARD CS125-45 OF THE NATIONAL BUREAU OF STANDARDS FOR PREFABRICATED HOMES

age of the offset wells completed by acidization indicated an increase in deliverability from 0 to 230 M.c.f. per day.

An evaluation program has recently been completed in this field which compared Hydrafrac completions with acid-completion methods, and showed that under conditions encountered in this field, gasoline-base Hydrafrac produces deliverability increases comparable to acid treatments; however, acid treatments to date are somewhat less expensive to perform.

A much stronger case for the economic possibilities of the process is found in the five oil wells in which Hydrafrac has resulted in sustained production increases. These are as follows:

Frannie field, Wyoming.—One well increased from 60 to approximately 160 bbl. per day, the second well from 60 to 72 bbl. per day as the result of Hydrafrac treatment; both these increases have been sustained for over a year.

East Sasakwa field, Oklahoma.—The well in this field, which was producing no oil and was scheduled for abandonment, has produced from 5 to 6 bbl. per day for 13 months since Hydrafrac treatment.

East Texas field.—A well which had produced no oil for 2 years, produced more than 50 bbl. of oil per day for several weeks while under special test after a Hydrafrac treatment, before being returned to its 20-bbl.-per-day allowable rate. This well has been producing at the 20-bbl.-per-day rate for 11 months since then, with periodic productivity tests to determine the maximum potential of the well. The last special test of this type indicated a well potential of 66 bbl. of oil per day.

Rangely field, Colorado.—One well which was producing approximately 75 bbl. of oil per day before treatment is now producing approximately 160 bbl. of oil per day as the result of two series of selective Hydrafrac treatments. This production has been sustained for a 6-month period following the second treatment.

Field Applications in Secondary Recovery

To date, the Hydrafrac process has been used almost entirely on oil and gas wells to stimulate production. However, with certain modifications, the process appears to have important potentialities when used on gas or water-injection wells, both to decrease the pressure required for injection and to control the point of entry of the fluids into the formation. This process can also be of aid in recovering a larger percentage of oil in place in producing wells in secondary recovery operations, by increasing the permeability and thus the production of zones that might otherwise be uneconomical to produce.

$5.07 saved a contract ...and a man's business

Special switches were needed to complete an electrical instrument contract. Late delivery of finished items would kill chances of future orders and lay off men. Switches were 1100 miles away, but Air Express delivered the 15-lb. package at 3 A.M. — 8 hours after pick-up. Cost, only $5.07. Air Express now used regularly. Keeps down inventory, improves customer service by early delivery.

Low as $5.07 was, remember Air Express rate *included* door-to-door service, receipt for shipment and more protection. It's the world's fastest shipping service that *every* business uses with profit.

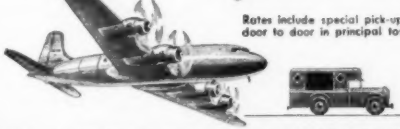
World's finest Scheduled Airline fleet carries Air Express. 24-hour service — speeds up to 5 miles a minute. Direct to over 1000 airport cities; air-rail for 22,000 off-airline offices.

FACTS on low Air Express rates:

17-lb. carton of hearing aids goes 900 miles for $4.70.
12 lbs. of table delicacies goes 600 miles for $2.53.
(Same day delivery in both cases if you *ship early.*)

Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
GETS THERE FIRST

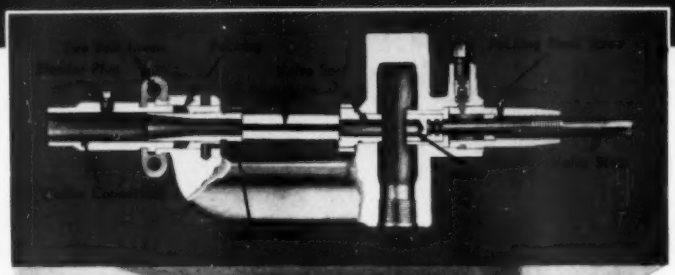


Rates include special pick-up and delivery door to door in principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

THE INDUSTRY'S FIRST UNITIZED X-MAS TREE
FLOW WING, AND STILL THE INDUSTRY'S CHOICE

Cameron TYPE "D" FLOW WINGS



Here, in a single compact unit, are all essential fittings required for a Christmas tree wing: An easily operable valve, a positive choke, an efficient 2-bolt flowline union and a bleeder plug to release pressure trapped in the line. Note how the positive choke section of the unit is so easy to get to . . . no cage nipple, threaded or flanged connections, or bean wrenches are required for choke changing. This operation is fast, safe and simple.

These efficient Cameron Flow-Wings may be incorporated in any manufacturer's Christmas tree. They are as interchangeable as a valve, pressure gauge or any other fitting.

Cameron Flow-Wings are available in both low pressure threaded models and with API flanged connections in test pressures ranging up to 15,000 lbs. Complete details are carried in your Composite Catalog or literature will gladly be sent to interested operators on request.

Cameron
IRON WORKS, INC.
P. O. BOX 1212 HOUSTON, TEXAS

Export:
74 Trinity Place New York, N. Y.

Use of Cable Tools in Wet Holes And at High Stroke Rates

by John F. Kendrick

INVESTIGATION of cable-tool drilling at high speeds has given rise to two rather startling conclusions. The study has indicated that it should be possible to operate the cable-tool drill at substantially higher strokes per minute than at the present time—speeds above that of resonance—and that it also should be possible to drill as effectively in a wet hole as in a dry hole. Realization of these two goals alone will effect a substantial reduction in the costs of drilling with cable tools. *(Previous articles on the study of cable-tool drilling by this author have appeared in The Oil and Gas Journal on December 13, 1947, July 1, 1948, and October 7, 1948.)*

It is general practice, at present, to slow up the motion of the drill as depth increases. There are two reasons for this. The peak of fundamental resonance, where reactions are destructive to either the drilling cable or the tools—depending on whether a tight or loose hitch is used—occurs at a lower number of strokes per minute, as the depth increases, and the signals by means of which the driller regulates his hitch disappear if the strokes per minute are increased as the depth increases. Means for protecting the bit while making the hitch and a drilling-motion indicator, which will make the stresses in the drilling cable at various points along the surface stroke visible to the driller, will be necessary to satisfactory operation at these higher speeds.

If the high speeds prove impractical, for some unanticipated reason, the drilling-motion indicator should make possible worth-while improvements in drilling performance. It may extend the useful life of the drilling cable by eliminating a needlessly tight hitch. It may warn the driller that his hole is deflecting while it is still practical to straighten it. It should make it possible to drill as effectively in a wet hole as in a dry hole, affording a practical means for coping with gas blows, freeing the drill from the course of excessive casing programs, in many instances, and making it practical to drill to the bottom of structure safely. It should make it possible to jar effectively and quickly. Finally, it should contribute an increment of increased drilling speed by making it possible to regulate the impact to the hardness of the formation, eliminating useless battering of the bit.

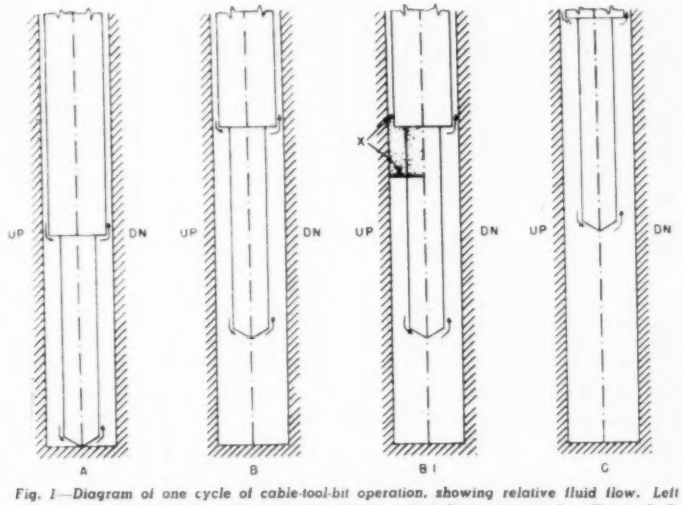


Fig. 1—Diagram of one cycle of cable-tool-bit operation, showing relative fluid flow. Left half of each chart represents the upstroke and the right half the downstroke. Charts A, B, and C represent three positions of the upstroke. As the bit and stem rise, they tend to leave voids which are filled by a downward flow of drilling fluid from the annular space. Therefore, there is no force acting during the upstroke tending to elevate the drill cuttings. Relative flow is reversed on the downstroke (right half of charts). As the bit and stem descend, they displace the fluid which flows upward into the annular space. Chart B-1 illustrates the special case where clearance between the wall of the hole and the drill-stem joints is reduced, creating a suction. Here, downward flow of fluid is "pinched" near the bottom of the stem. During maximum velocity of the upstroke, a void "X" will appear at bottom of stem. This void will be closed at beginning of downstroke, and the effect of reduced clearance is to reduce velocity of the downstroke

Increasing Strokes per Minute

Increase in strokes per minute will have to be done without materially changing the basic peak stress in the drilling cable or the basic impact of the bit. Fortunately, these vary in the same way, and, if the system were inelastic they would be controlled by reducing the length of stroke in proportion to the increase in the strokes per minute. In other words, if the strokes per minute are doubled, the length of stroke would be reduced to half and if the strokes per minute are tripled, the length of stroke would be reduced to one-third.

However, the problem is somewhat more complicated in the elastic range of the cable-tool drill. The elasticity of the drilling cable tends to reduce the peak stress in the cable, just as pulling back, when catching a baseball, reduces the sting. The impact of the bit with the bottom of the hole throws off a large part of the inertia due to the string of tools, and tends

The Author

The author is an independent consulting engineer who is closely identified with improvement and research in cable-tool drilling. He is registered as a mechanical engineer with the State of Ohio, and makes his residence at 16 East Broad Street, Columbus. This paper was presented by the author before spring meeting of Eastern District, American Petroleum Institute, Division of Production, at Pittsburgh, April 27-29.

to reduce the stress in the cable. A tight hitch increases the stress in the cable and reduces the stresses in the tools. A loose hitch works oppositely, reducing the stress in the cable and increasing the stresses in the string of tools. Below resonance, increasing the strokes per minute causes the bit to overstroke, which increases the impact of the bit, unless the hitch is tightened. If the hitch is tightened the stress in the cable is increased.

Above resonance, increasing the strokes per minute causes the bit to understroke, which presumably reduces both the impact of the bit and the stress in the cable. While the tools are substantially in phase with the surface motion below resonance, they are 180° out of phase with the surface motion above resonance; that is, the bottom of the drilling cable is coming up while the top of the cable is going down.

There is not a single dynamometer card, or stress-stroke diagram of either a cable-tool drill or sucker-rod pump operating above resonance available for analysis. There is, therefore, very little known of the velocity diagram of the lower end of the cable when operating in this zone.

Fundamentally, the length of the surface stroke will have to be determined as though the system were inelastic, and the best strokes per minute above resonance determined with the aid of a dynamometer or drilling-motion indicator. Through trial and error, the best combination of length of stroke and strokes per minute can be determined for any given tooling and depth of hole. As this will involve some risk, the initial experiments should be run in dry holes. Such a spot check can be done fairly quickly and relatively inexpensively, and should make it possible to evaluate the economics of drilling above resonance. In view of the large number of factors involved, the working out of the new technique for all conditions will be fairly protracted, and, obviously will have to be done under supervision that understands the probable relationship of all the factors.

Mixing of Cuttings

As this procedure may involve drilling with a 10 or 12-in. surface stroke, under some conditions, we should examine the effect of the subsurface stroke on "mixing of the cuttings." Fig. 1 is a diagram of one cycle of the bit, showing the relative fluid flow. The left half of each sketch represents the upstroke, and the right half of each sketch represents the downstroke. Ignoring sketch B-1 for the moment, sketches A, B, and C represent three positions of the upstroke. As the bit and stem rise, they tend to leave voids, which are filled by a downward flow of fluid from the annular space between the wall of the hole and the stem. There is, therefore, no force acting during the upstroke that tends to elevate the cuttings. The relative flow is reversed on the downstroke, as shown by the right half of sketches A, B, and C. As the bit and stem descend, they displace the fluid which flows upward into the annular space.

As this action is initiated by the lower end of the bit, the upward flow cannot affect the coarse cuttings on the bottom of the hole until just as the bit strikes the bottom of the hole. Then the cuttings must be jetted up the water courses on the side of the bit.

Due to the lack of buoyancy of the coarse cuttings, they start to settle as soon as their velocity is checked, and the rate of settling is not impeded by the downward flow of the fluid from the annular space, as the upstroke proceeds. Therefore, the coarse cuttings are normally on the bottom of the hole when the bit strikes, and cannot be mixed with the drilling fluid until they are reduced to colloidal or flour size. Then the buoyancy effect will be large enough to retard the rate of settling, so that the jetting action as the bit strikes the bottom of the hole imperfectly mixes the colloidal cuttings with the drilling fluid.

The special case in which the clearance between the wall of the hole and the joints of the stem is reduced to create a "suction" is illustrated in sketch B-1. Here the downward flow of the fluid from the annular space is pinched near the bottom of the stem. During maximum velocity of the upstroke, a void X will appear at the bottom of the stem. This will be enlarged by the downward flow of the fluid to fill the void left by the bit, as no force is present to elevate the fluid. This void will be closed at the beginning of the downstroke, and the only effect of the reduced clearance is to reduce the velocity of the downstroke.

This description of a cycle of the bit can be confirmed by closing one end of a glass tube with a stopper, placing water with various types of cuttings in the tube and stabbing at them with a cold chisel. It is also confirmed by the everyday observation of the large percentage of the cubic inches of formation cut during each run of the bit that is reduced to colloidal size. It is also confirmed by the relative infrequency the tools are stuck whenever drilling is stopped to pull out. If the mixing was as thorough as some picture it, one could easily expect the coarse cuttings to settle on the reaming edges of the bit, and to bridge and stick the bit more frequently. Therefore, it seems to conclude that the coarse cuttings are on the bottom of the hole each time the bit strikes, that the length of the subsurface stroke is immaterial, so long as the impact of the bit is adequate, and that a short, fast subsurface stroke—a "hammer drill action"—should prove satisfactory.

Drilling a Wet Hole

It is supposed by some that the bottom-hole pressure in a deep wet hole will so decrease the weight of the tools and/or increase the frictional drag on them as to preclude drilling under such conditions. The pressure at the bottom of a 10,000-ft. hole is not apt to exceed 5,000 psi. Water is not significantly compressible at that pressure. Therefore, the buoyancy of the string of tools and drilling cable will not be changed significantly. Also, the difference in pressure between the top of the rope socket and the bottom of the bit will be the same in a deep wet hole as in a shallow one.

The rule that friction increases in proportion with pressure applies to unlubricated surfaces only. The viscosity* of the film is the dominant factor, when the surfaces are lubricated, until the film breaks down under pressure. As the cable and tools are immersed in fluid no question of film failure is involved. As the fluid is not significantly compressible, there should not be a significant change in the viscosity and the increased bottom-hole temperature should tend to reduce the viscosity, although not significantly. The frictional drag on the drilling cable increases slightly with depth. Altogether, the variation in friction with depth is not likely to be greater than can be compensated for by a slight change in motion or a slight increase in the surface stroke.

The problem of operating the sucker-rod pump closely parallels this problem, as it operates continuously in a wet hole. While a depth of 9,000 ft. is beyond the practical reach of the pump at the present time, the operation of the sucker-rod pump in 3,000 and 6,000-ft. wells has been studied both on a volumetric efficiency basis and with the dynagraph, in instrument that measures the load on the polished rod and its stroke. These experiences confirm the above description, and it seems safe to conclude that we can drill satisfactorily in a wet hole regardless of depth.

*Since this paper was presented at the Pittsburgh A.P.I. meeting, Dr. Robert W. Schiessler, Pennsylvania State College, has kindly called attention to a publication by Prof. P. W. Bridgman, "The Effect of Pressure on Forty-three Pure Liquids" in the Proceedings of the American Academy of Science, Vol. 61, page 57 (1926). At 86° F. and 19.5 psi., the relative viscosity of water is 0.488 and at 500 kg. per cm.² (roughly 7,000 psi.), the relative viscosity is 0.500, an increase of 0.2 per cent. While the relative viscosity at 500 kg. per cm.² is decreased more than half by increasing the temperature from 86° to 167° F., that is from 0.500 to 0.230.

THE PIONEER STILL IS PIONEERING

MUD is big business!

Not the kind of mud little Johnny tracks into the house on rainy days—but the special kind of mud that is so vital in drilling modern wells.

Last year the oil industry bought more than ten million dollars' worth!

That's Big Business, and it highlights the importance of pioneering work done years ago by National Supply in the development of better slush pumps . . . pumps that not only supply the necessary pressure under *accurate control,* but that also stand up under the severe punishment of millions of sharply abrasive particles in the mud. Today you can see "Ideal" Slush Pumps in every important oil field, working along with the other National Supply machinery and equipment which has won the confidence of oil men throughout the industry.

In addition to developing better pumps, National Supply has pioneered in a better way to use pumps. In "compounding" pumps, National Supply engineers have devised the first *practical* method of connecting two or more pumps in series so that they work smoothly together.

It is this kind of *practical* pioneering through which The National Supply Company has always paced the development of better products and services for the oil industry, and for many other industries as well.

THE NATIONAL SUPPLY COMPANY

Executive Offices: Pittsburgh, Pa.

NATIONAL OIL FIELD MACHINERY & EQUIPMENT

SPANG PIPE
SUPERIOR ENGINES

YOU CAN'T MEASURE SUCKER ROD

by appearance

Performance proves National's Extra Quality!

You'll never appreciate the enduring quality and rugged dependability of National Sucker Rods by examining them. BUT . . . watch them perform and you'll be convinced none better can be found anywhere . . . When you run a string of National Rods they're in for a long stay and they greatly reduce operating costs.

Consistent outstanding performance in oil fields everywhere results from the *extra quality* built into every National Rod. The steel, for example, is constantly checked by the Chemical and Metallurgical Laboratories to maintain specifications that provide strings of uniform strength. Precise manufacturing practices are observed in forging, normalizing and threading. And rigid inspection before shipment guarantees that each rod measures up to very exacting standards.

Write for descriptive bulletin or consult your National Supply Store for advice concerning the rod best suited to your needs.

FOR DRILLING ★ *THE INDUSTRY'S MOST COMPLETE*

A

GRADE 30

Recommended for light and medium pumping loads where fluids are non-corrosive. It may be used with fair success in the presence of small quantities of hydrogen sulphide. Available in double-pin type.

GRADE 40

Will handle heavy pumping loads where fluids are non-corrosive and there are no appreciable quantities of sulphides. Made in double pin type only.

GRADE 81

Will handle heavy pumping loads where corrosion is bad but sulphides not severe. Made in double pin type only.

GRADE 91

Recommended for heavy corrosive and sulphide pumping loads under severe conditions. Made in double pin type only.

THE NATIONAL SUPPLY COMPANY

GENERAL SALES OFFICE: **TOLEDO, OHIO**

DIVISION OFFICES: CASPER; FT. WORTH; PITTSBURGH; TULSA; TORRANCE.
EXPORT: NATIONAL SUPPLY EXPORT CORPORATION, 30 ROCKEFELLER PLAZA, NEW YORK, N. Y., U. S. A.; RIVER PLATE HOUSE, 12 SOUTH PLACE, LONDON E. C. 2.

THE NATIONAL SUPPLY COMPANY — NSCO

NATIONAL BLUE PRODUCTS

LINE OF OIL FIELD EQUIPMENT ★ FOR PRODUCTION

There's no Detour FOR TOOLS

...IN SPANG

EXTREME LINE CASING

● The Spang Extreme Line Casing joint is streamlined on the inside which helps tools get to work without delay. There is no big recess such as found between the pipe ends of ordinary casing . . . instead there is just a narrow streamlined groove. Consequently, there are no detours to provide restrictions or obstructions for bits, swabs, packers or other tools to hang up going in or coming out of the hole.

What's more, the streamlined bore slows down corrosion. It reduces turbulence at the joint which prevents protective films from being washed away and exposing fresh metal to attack.

Write us for complete details about Spang Extreme Line Casing or contact one of our field engineers direct or through a nearby National Supply Company store for expert help on all your casing problems.

SPANG EXTREME LINE CASING

has 8 distinctive advantages

1. High Joint Strength.
2. Positive Resistance to Leakage.
3. Minimim Outside Diameter at Joint.
4. Maximum Speed in Running.
5. Streamlined Exterior Contour.
6. High Resistance to Damage.
7. *Internal Flush Joint
8. 50% less threaded connections than A.P.I. Casing.

*All but lightest weights of a size will pass the A.P.I. drift.

THE NATIONAL SUPPLY COMPANY

SPANG-CHALFANT DIVISION, PITTSBURGH, PA.

GENERAL SALES OFFICE: PITTSBURGH, PA.

DISTRICT SALES OFFICES: ATLANTA; BOSTON; CHICAGO; DENVER; DETROIT; HOUSTON; LOS ANGELES; NEW YORK; PHILADELPHIA; PITTSBURGH; ST. LOUIS; SAN FRANCISCO; TULSA

THE NATIONAL SUPPLY COMPANY — NSCO — NATIONAL BLUE PRODUCTS

★ THE INDUSTRY'S MOST COMPLETE LINE OF OIL FIELD EQUIPMENT ★

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

This department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in various phases of plant operation, as well as those connected with the marketing and utilization of petroleum products. Readers are invited to submit their problems to W. L. Nelson, technical editor. Inquiries must be signed, but only the initials will be printed.

TABLE 1—OCTANE NUMBERS OF THERMALLY CRACKED GASOLINES AS A FUNCTION OF THE CHARACTERIZATION FACTOR OF THE CHARGE STOCK

Characterization factor of feed	Name of crude oil	Octane No. (clear) Motor	Research
11.0		75.4	89.4
11.2		73.2	87.8
11.4	Naphthene base	71.3	85.0
11.6		69.2	81.4
11.8	Intermediate base	67.1	76.6
12.0		65.0	71.6
12.2	Paraffin base	62.5	66.0

Estimating Octane Numbers Of Thermal Gasoline

We have a 13.8°-A.P.I.-gravity crude oil. Would such a crude oil produce a cracked gasoline of high octane number?—S. P. E.

Such a crude oil is probably an asphalt or naphthene-base oil, and the octane number of the gasoline produced by thermal cracking will be relatively high in octane number. Likewise, if the crude oil contains any straightrun gasoline, it too will have a high octane number.

Generalities are dangerous because the behavior of stocks varies widely, but according to data given by Mithoff, McPherson, and Sipos (*California Crude Oils, The Oil and Gas Journal, November 6, 1941, page 81*) and by Peterson and Cannon (Crude Oil Assays, Pet. Processing, October 1946, p. 113) the effect of the kind of charge stock on octane number of the gasoline is somewhat as shown in Table 1.

Research Versus Motor Octane Numbers

Note: The following information is a continuation of our question of May 12.

Little information on the research octane numbers of straightrun or natural gasoline is available because they are so nearly the same as the motor octane numbers. However, the difference in the octane numbers by the two methods is large for cracked or olefinic gasolines, and hence many tests are reported. Table 1 shows the approximate differences in the research and motor method octane numbers for common cracked gasolines. Only 33 sets of data were readily available, but some of the points represented the average of many gasolines.

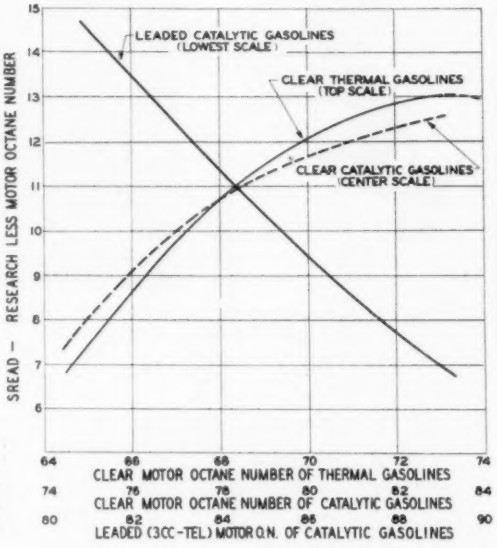

LEADED CATALYTIC GASOLINES (LOWEST SCALE)
CLEAR THERMAL GASOLINES (TOP SCALE)
CLEAR CATALYTIC GASOLINES (CENTER SCALE)
SREAD - RESEARCH LESS MOTOR OCTANE NUMBER
CLEAR MOTOR OCTANE NUMBER OF THERMAL GASOLINES
CLEAR MOTOR OCTANE NUMBER OF CATALYTIC GASOLINES
LEADED (3CC-TEL) MOTOR O.N. OF CATALYTIC GASOLINES

Fig. 1—Average spread of octane number between the research and motor octane numbers of cracked gasolines

Table 1 indicates generally that the spread between the research and motor octane numbers of unleaded cracked gasolines is greater for high-octane materials. However, for leaded gasolines, the reverse is evident. This is probably due to the fact that low-octane materials usually have a better susceptibility to tetraethyl lead. Table 2 shows the same relationship.

TABLE 2—A COMPARISON OF THE RESEARCH AND MOTOR OCTANE NUMBERS OF CATALYTIC GASOLINES

Motor* Oct. No.		Research* Oct. No.		Spread between research and motor octane number: Unleaded		With 3 cc. TEL	
Clear	3 cc. TEL	Clear	3 cc. TEL	Range	Average	Range	Average
75	80½	83	92½	5-11	8	9	12
77	82	87	93½	6.5-13	10	8-15	11½
79	84	90	95	8-14	11	7-14	11
81	88	93	98	9.5-15	12	6-13	10

*Average

TABLE 1—RESEARCH LESS MOTOR OCTANE NUMBERS OF CRACKED GASOLINES

Motor Oct. No.	Kind of gasoline	Research less Motor Oct. No.: Range	An avg.
65	Thermal	6-10	7½
67	Thermal	7-11	9½
69	Thermal	8.5-12.5	11½
71	Thermal	10-15	12½
73	Thermal	11-14	13
74	Poly (Thermal)		14
78	Poly (Thermal)		18
75	Catalytic	5-11	8
77	Catalytic	6.5-13	10
79	Catalytic	8-14	11
81	Catalytic	9.5-15	12
83 with 3 cc. TEL	Catalytic	9-15	12½
85	Catalytic	7-13.5	10½
87	Catalytic	5-12	8½
89	Catalytic	10	7

great names

B. F. Goodrich

Among the many "great names" Goodrich products is the Super-Hipress cable-construction hose. This heavy-duty hose is made to give long wear and efficient service. Goodrich Super-Hipress cable-construction hose and all your oil field supplies are available at the 17 United Supply Stores.

Uncle Sandy THE UNITED SUPPLY MAN

Courtesy
Service
Dependability

UNITED SUPPLY
AND *Manufacturing* COMPANY
TULSA, OKLAHOMA
Stores in Kansas, Oklahoma, Texas, Louisiana, and New Mexico

1. General view of Standard of California's new package and grease plant at Richmond. Installation covers 7½ acres, handles virtually every product the company puts in packages. A total of 20 miles of pipe lines moves the basic lubricants and blend stocks through the plant. Large drums are delivered on a mile-long conveyor system to freight cars, of which 32 can be handled at one time

2. Heart of the vast barrel-conveying system is this small, centrally located booth from which push-button dispatching is accomplished. Electronic control system checks each barrel past one point and permits assembling of orders at proper locations for loading. Conveyor system takes barrels to railroad loading dock at rear of building

3. Battery of kettles on grease-mixing floor. Twenty-nine automatic mixers have annual capacity of 38,000,000 lb.

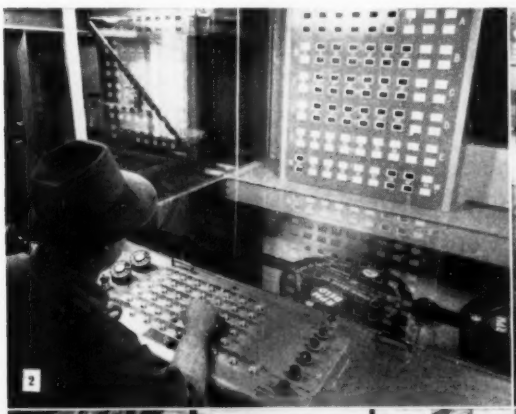
4. Drum filling and weighing in grease manufacturing section

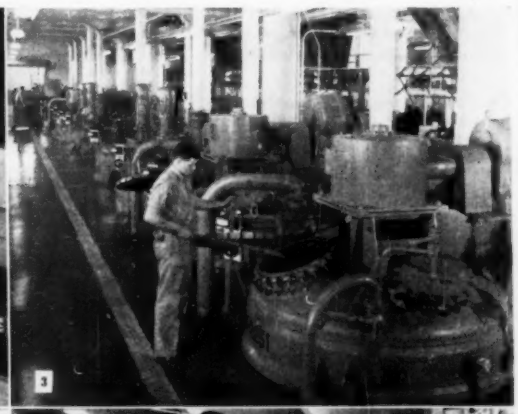
5. Electric fork lift truck is shown in operation. The building will stock 160,000 packages, from handy 4-oz. oil cans to 415-lb. drums

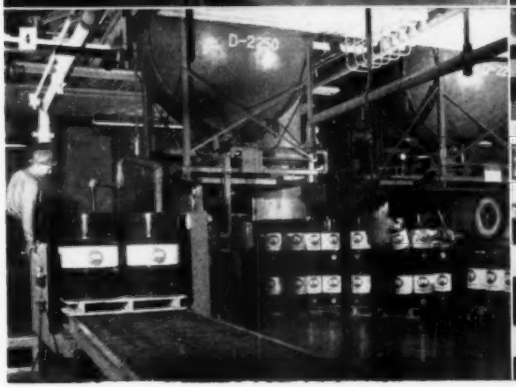
NEW PACKAGE AND GREASE PLANT OPENED ON WEST COAST

STANDARD OIL CO. OF CALIFORNIA has placed in operation at its Richmond refinery a new package and grease plant for manufacture of more than 250 miscellaneous petroleum products. The new installation is highly automatic and incorporates many "push button" features. Covering 7½ acres, this modern unit is designed to store and ship nearly every product the company puts in packages, ranging from pharmaceutical white oils to the heaviest of greases. Loads handled vary from small cases of sewing-machine oil to drum pallets weighing over a ton.

Unique in many of its features is the conveying system. The basement







? HAVING TROUBLE PUMPING HEAVY OILS?
CONCERNED ABOUT LOSSES RESULTING FROM VOLUME SHRINKAGE AT LOW OIL DELIVERY TEMPERATURES? ...THEN INSTALL

Paracoil

TANK SUCTION HEATERS

TO SOLVE YOUR PROBLEMS

TANK SUCTION HEATER INSTALLATION

The shell is open at the inside end. The oil moves across the heating tubes as it passes through the shell to the suction connection outside the tank.

In Bulk Oil Terminals and Refineries the world over Paracoil Tank Suction Oil Heaters are licking the problem of economically preheating heavy viscous oils to permit their withdrawal from storage tanks. They are also preheating the lighter grades of fuel oils to their proper delivery temperatures to avoid the costly volume losses incurred when such oils are sold at low temperatures.

WITH PARACOIL TANK SUCTION OIL HEATERS

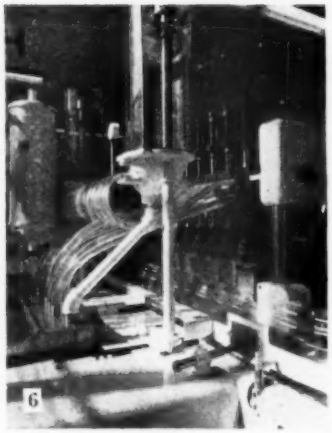
- **You Heat Only The Oil That Is Being Withdrawn From The Tank.** (Thus radiation losses resulting from heating entire tank contents are eliminated.)
- **Overall Steam Consumption And Heating Costs Are Held To A Minimum.**
- **Heater Tube Bundle Can Be Withdrawn For Inspection And Cleaning.** Breaking of oil suction line not necessary.
- **All Piping Connections And Gaskets Are Outside The Tank.**
- **U-Tube Design Permits Free Expansion And Contraction Of Tube Bundle.** Either high or low pressure steam can be used as the heating medium.

Prompt Shipments!
Our extensive stocks of tubing and pipe enable us to make quick deliveries to meet your immediate requirements.
Write for Descriptive Literature

SPEED UP DELIVERIES AND CUT OIL VOLUME LOSSES WITH PARACOIL TANK SUCTION HEATERS

In addition to the Paracoil Tank Suction Heaters, we also design and fabricate Line Type Discharge Heaters of any capacity. Illustrated is a Paracoil Straight Tube Type Fuel Oil Heater for bulk station service—capacity 2,000 gallons per minute, No. 6 oil, 100°F to 160°F, steam at 15 psig. Weight 12 tons.

DAVIS ENGINEERING CORPORATION
1060 East Grand Street, ELIZABETH 4, NEW JERSEY
30 Rockefeller Plaza, NEW YORK 20, N. Y.



6. Fully automatic machine shown here fills pint or quart bottles with "white" mineral oil at the rate of 15,000 per 8-hour day. Bottles are passed through an automatic cleaning unit first, and are later labeled and packaged. White oil is used for medicinal purposes and in the manufacture of cosmetics

floor resembles a miniature-railroad switchyard, with a mile of roller conveyors, along which heavy drums are "switched" by electronic controls to railroad spur tracks, truck-loading docks, and to storage, at the rate of one every 3 seconds.

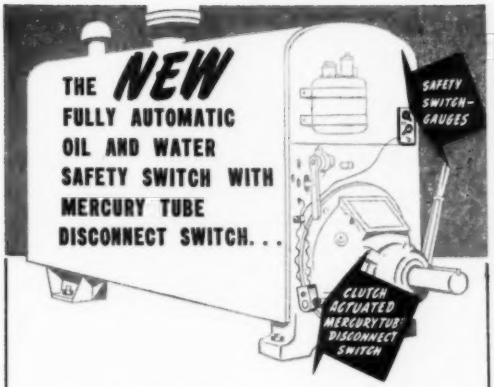
The basic lubricating and blending stocks are moved through 20 miles of pipe lines which lace the building. Greases, lubricants, and specialties, production of which is at the rate of 38,000,000 lb. a year, are mixed in 29 automatic mixers with capacities of from 10 to 75 bbl. per batch.

Eight Spur Tracks

The building will stock 160,000 packages, ranging from 4-oz. cans to 415-lb. barrels. To handle that portion of the daily business which moves by rail, the plant has eight spur railroad tracks under its roof and can accommodate up to 32 box cars at a time.

Nine can-filling units make up the lubricating oil packaging section. One of the units can fill and cap 48,000 quart cans of oil in a working day, moving at the rate of two cans per second. Another, filling 2½-gal. tins, handles 6,000 of these larger containers in an 8-hour period. The warehousing section of the plant stocks approximately 1,000 items, which are handled by 10 fork trucks, 11 trans stackers, 2 tractors, and 42 trailers.

Standard of California's new wax plant at Richmond, which has a capacity of 45,000,000 lb. of wax per year, was described in the Journal's April 7, 1949, issue, page 69.



THE **NEW** FULLY AUTOMATIC OIL AND WATER SAFETY SWITCH WITH MERCURY TUBE DISCONNECT SWITCH. . .

Here's EXTRA safety for your engine! MURPHY Safety Switches now have a new Mercury Tube Clutch Actuated Starting Switch. When clutch is disengaged, the oil pressure Safety Switch is cut off automatically. When clutch is engaged, Switch is automatically reconnected. Then, Safety Switch is at work . . . ready to stop engine when oil pressure gets too low or when water system fails.

• See Your Supply Store or Engine Dealer.

FRANK W. MURPHY
Manufacturer
Box 1476 • Tulsa, Oklahoma

SUN DUAL FLOW FILTERS
CUT LUBRICATION COSTS

because they REFINE as they FILTER!

Sun Dual Flow Filters provide a positive lubricating oil filtration that keeps oil CLEAN at all times—under any operating condition! You'll have fewer oil changes because Sun Dual Flow Filter's continuous REFINING process positively prolongs the life of the lubricant.

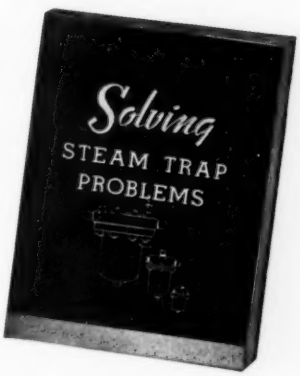
Also manufacturer of Sun Regular Flow Oil Filters and Sun Diesel Fuel Filters.

Sold through supply stores only

SUN ENGINEERING COMPANY
P. O. BOX 4404 · OKLAHOMA CITY 9, OKLA. · PHONE 6-1447

This Book Saves MONEY-TIME-LABOR!

● This new book saves money for steam trap users. It tells how to lower steam trap installation and maintenance costs. From its pages you can select the type, size and make of trap to fit your needs . . . it's all there in simple tables. There are many helpful notes and drawings on maintenance suggestions. Learn today how to get economical steam trap operation. Write for your copy on business letterhead.



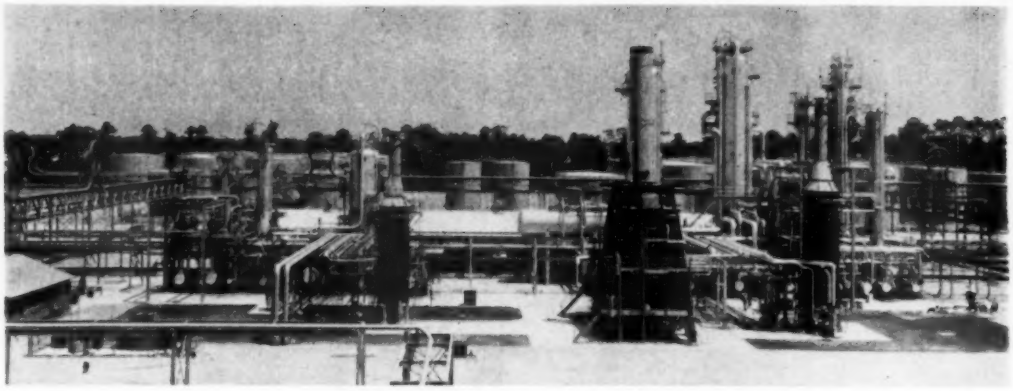
MAIL COUPON TODAY!

SUPER-SILVERTOP STEAM TRAPS

THE V. D. ANDERSON CO.
1981 W. 96th STREET • CLEVELAND 2, OHIO

Gentlemen: Please send me a copy of the new book, "Solving Steam Trap Problems".

Name .....
Company .....
Street .....
City ..... *State* .....



In this view of Shell Oil Co., Inc.'s, new combination lube unit may be seen the propane deasphalting plant, left, and the phenol extraction unit, right. This is a portion of Shell's 2,800-bbl.-per-day lube plant near Houston, built at a cost of $20,000,000

Combination Lube-Oil Plant

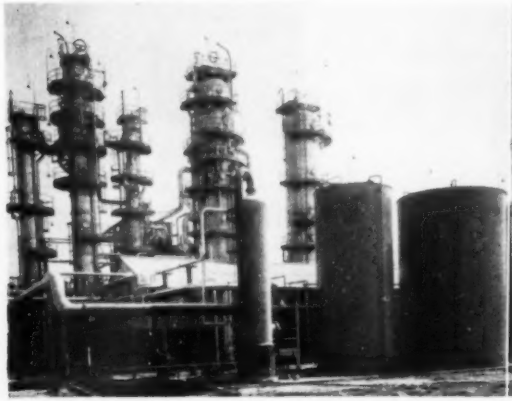
Shell Oil Installs Propane-Deasphalting And Phenol-Extraction Units at Houston

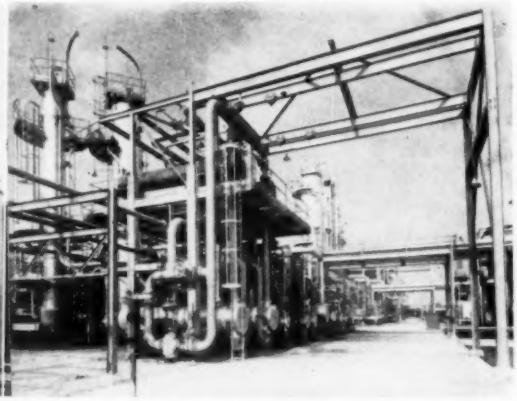
TWO of the latest Shell Oil Co., Inc., Houston refinery lubricating-oil units to go into operation, a propane-deasphalting unit and a phenol-extraction unit, are designed and constructed as one combination unit with common facilities and control. The propane deasphalting unit processes 4,500 bbl. per day of reduced crude, the residue of a vacuum distillation operation. Production from this unit becomes part of the feed to the 5,800-bbl. daily phenol-extraction unit, along with fractions from other refinery operations at Shell's plant.

The amount of piping used on refining installations of this kind is tremendous—amounting to 25 per cent of the cost of the whole plant. Piping systems such as employed in these lube plants always present a number of design problems. Careful attention was concentrated on this phase of design of the plant and one of the most efficient piping layouts operating in this country is the result. There is no buried piping anywhere in the plant, other than sewer lines.

Overhead piping is supported off the ground in several layers or banks by steel supports which provide a minimum clearance of 10 ft. An operating feature supplementing this arrangement is that all elevated valves located more than 6.5 ft. from ground and which cannot be conveniently

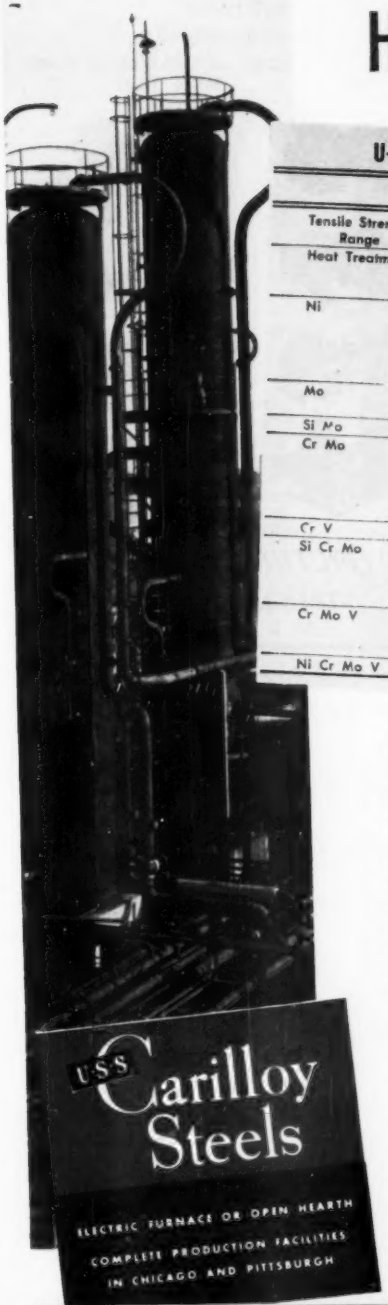
Left: These five towers are used in the phenol-extraction section of Shell's combination lube-oil plant. From left to right these vessels are: absorber tower, raffinate column, extract stripper, phenol tower, and treating column. Right: Servicing of exchangers and other equipment in Shell's new combination deasphalting and extraction unit is simplified by the paved alleyway seen in this view of the plant. The structure in the foreground supports rails for carrying the trolleys used in removing exchanger bundles





Here are the steels to use for

High or low temperature service



U-S-S Carilloy Steels Recommended for Refinery Application

	Low Temperature	High Temperature				
Tensile Strength Range	110,000 psi max.	100,000 psi max.				
Heat Treatment	Normalized or normalized and tempered	Normalized, normalized and stress relieved, or annealed				
Ni	1.50% Ni 2.25% Ni 3.50% Ni 5.00% Ni 8.50% Ni					
Mo		Low C .50% Mo				
Si Mo		Low C 1.00% Mo				
Cr Mo		Low C 1.25% Si .50% Mo				
		Low C .50% Cr .50% Mo				
		Low C 1.25% Cr .50% Mo				
		Low C 2.00% Cr .50% Mo				
		Low C 2.25% Cr 1.00% Mo				
Cr V		Low C 3.00% Cr 1.00% Mo				
Si Cr Mo		Low C 1.00% Cr .15% V				
		Low C .75% Si 1.75% Cr .75% Mo				
		Low C 1.25% Si 2.00% Cr .50% Mo				
		Low C .75% Si 2.50% Cr .50% Mo				
Cr Mo V		Low C 1.25% Si 3.00% Cr .50% Mo				
		Low C .50% Cr .50% Mo 1.00% V				
		Low C 1.00% Cr .35% Mo .25% V				
Ni Cr Mo V		Low C 1.25% Cr 2.00% Mo .25% V				
		Low C .75/3.00% Ni 1.00% Cr .50% Mo .10% V				

▶ Where your equipment must operate at elevated temperatures and pressures, or at sub-zero temperatures, no ordinary steel will do.

U-S-S Carilloy Steels offer you service-tested steels that have proved their ability to safeguard performance in cracking units, pressure tanks, pumps and valves, boilers, superheaters, and high temperature, high pressure piping.

These superior steels have a demonstrated high resistance to creep. They maintain their strength at elevated temperatures, as well as toughness at low temperatures. They can be heat treated to develop the optimum properties for either high or low temperature operation. Many of them were developed by our steel technicians working side by side with designers, builders and users of refinery equipment, having always in mind the special and exacting requirements of oil refining service.

Not only do U-S-S Carilloy Steels meet these requirements, but they permit a wide flexibility in selection so that the qualities desired can be secured to whatever extent called for by the design. To assist you in their most economical application, the cooperation of our metallurgists is freely at your service.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Supply Company, *Warehouse Distributors—Coast to coast*
United States Steel Export Company, New York

8-354

USS STEEL

UNITED STATES STEEL

PORTABLE WIDE-RANGE FLOW TESTING KIT

FOR LABORATORY RESEARCH AND FIELD FLOW RATE CHECKING WORK

ACCURATE
VERSATILE
INEXPENSIVE

"C-Clamp" FLOWRATOR meter kit. The meter is provided with a convenient carrying handle, base plate and hose connectors.
NET PRICE $91.00

Practically any laboratory or field problem that requires an accurate determination of the flow rates of liquids or gases is readily handled with the versatile F&P FLOWRATOR (formerly called Rotameter) flow meter kit.

The new "C-Clamp" FLOWRATOR instrument kit consists of an extremely flexible combination of one meter, four metering tubes and six readily identified floats. The selection of proper tube and float combinations is simplified. The "C-Clamp" meter construction permits easy disassembly for quick metering tube changes. Capacities from 0.065 to 2200cc/min. of water and 5.0 to 36,800 cc/min. of air are covered. Send for Catalog 30 for details.

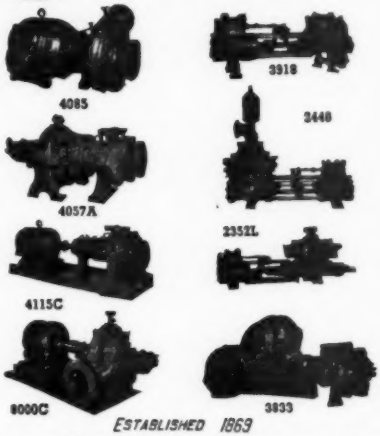
FISCHER & PORTER CO.
DEPT. 9Q-3E HATBORO, PENNA.

FLOWRATOR
TRADEMARK

PUMPS

CENTRIFUGAL
RECIPROCATING

BUILDERS OF OUTSTANDING PUMPS
Since 1869

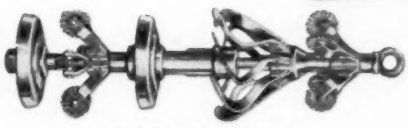


ESTABLISHED 1869

DEAN BROTHERS PUMPS INC.
INDIANAPOLIS IND.
323 W TENTH ST.

Keep your pipes clean!

NORTHRUP GO-DEVILS



Disc-Cup Model — Size 6"

Sound design and top quality make Northrup Go-Devils clean thoroughly and last long.

Northrup Go-Devils are priced lower than others; yet they serve better and longer.

Every order shipped the day received

WASHINGTON ENGINE & PUMP CO.
Box 372, Washington, Pa.

operated by hand, are provided with chain-wheel operators. All insulated piping and other outside equipment is aluminum jacketed for weather protection. Aluminum paint has been applied in the other sections of the plant. The piping is all carbon steel, the maximum diameter being 18 in. (for the main water lines). Exposed steelwork is galvanized, including all bolts and fastening members—for protection against rust and corrosion, and also to keep down the high cost of paint maintenance.

The 150-ton propane treating tower, 50 ft. high by 11 ft. inside diameter, is designed for pressure service in the range of 500 psig. Its shell was fabricated of $2\frac{1}{8}$-in. steel plate, X-rayed and stress relieved. Oil feed enters the tower about halfway up, liquid propane enters near the bottom, deasphalted oil leaves the top, and an asphalt solution is removed from the bottom. A vertical-tube, cylindrical-shell-type furnace is employed for heating the asphalt solution bottoms of the treating tower, prior to stripping off the propane from the asphalt. Propane is removed from the refined overhead of the treating tower also by stripping.

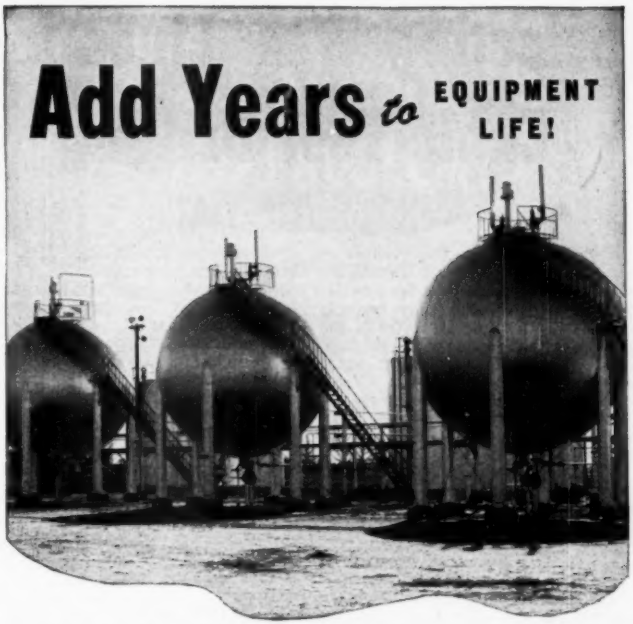
Phenol-Extraction Heat

Heat for the phenol-extraction process is supplied with an A-frame furnace which was specifically designed to heat 15,000 bbl. per day of extract solution to 550° F. without cracking, and a cylindrical type raffinate heater. This cylindrical heater vaporizes phenol from the prime product (raffinate) which is the overhead from the phenol treating tower.

The phenol-extraction section of this combination lube unit consists of five towers. Oil feed from the propane deasphalting section or from the vacuum distillation unit is initially contacted with phenol in a treating tower. Phenol is removed from the extract solution (bottoms of phenol treating tower) in the phenol tower. The three other towers are extract stripper, raffinate tower (combined with raffinate flash stripper), and absorber.

For ease of construction and maintenance, the unit was laid out in four parallel rows: a tower row, an exterior row made up of two pump houses separated by a combination control room, a furnace row, and an exchanger row. A complete paved service alley designed for the use of trucks and tractors to permit easy pulling of tube bundles during turnarounds, separates the exchanger row from the furnace row. Maintenance economy is one of the many features incorporated into the unit. For example, the elevated exchangers are provided with permanent monorails and trolleys to decrease the number of manhours required for servicing.

This combination lube unit at Houston was designed and constructed by M. W. Kellogg Co., New York.



RUST-OLEUM

Stops Rust!

Around the clock, rust ravages your property. Tanks, pipelines, derricks, pumps — all metal surfaces — are damaged by rain, fumes, dampness, salt air and ordinary weathering. Lengthen their life by providing Rust-Oleum protection. *Replacements are costly!*

RUST CAN BE STOPPED! Many oil companies find Rust-Oleum the best answer to rust problems. It was developed particularly to stop rust damage.

Rust-Oleum coats metal surfaces with a firm, tough, moistureproof, dry film that lasts years longer. Rust-Oleum can be applied over metal that is already rusted. It stops further damage.

Write for full information today and tell us your rust problems.

Rust-Oleum is carried in stock by industrial distributors in most principal cities

Mail This Coupon TODAY!

See our catalog in Sweet's . . . or write for complete information.

RUST-OLEUM CORPORATION
2469 Oakton Street, Evanston, Illinois

Name_____

Company_____

Address_____

City_____ State_____

Selecting Wire Lines for Cable-Tool Drilling

by R. B. Anderson*

SELECTION of the proper cable or wire line is of first importance when choosing equipment for a cable-tool drilling job. In many respects the cable is the limiting factor in the application of cable-tool drilling, especially with regard to depth. Since cable tools are widely used, almost exclusively in the Appalachian region, the care necessary to selecting each item of equipment should not be underrated. Different types of drilling equipment impose different wire-line requirements. For example, more severe conditions are experienced on a spudder than on a drilling machine or standard rig from the standpoint of the sheaves and drums. Wire-rope manufacturers will doubtless agree that a reverse bend over sheaves requires larger sheaves than a partial bend. The drilling machine and standard rig do not work the line over sheaves or drums except while pulling out or running in, and while spudding the first few hundred feet. The spudders usually operate over three sheaves and one drum at all times with two of the bends being reverse bends. It is obvious, therefore, that the line construction on a spudder can be very important and should be such that can best withstand bending stresses.

Some manufacturers recognize that the minimum drum and sheave diameter varies with the cable construction for a given size of line with equal numbers of wires—others do not. The Eastern District A.P.I. Subcommittee on Wire Rope has requested the American Petroleum Institute to establish critical and minimum sheave and drum diameters for each construction commonly used in the oil fields. This problem is before the Manufacturers' Subcommittee and a recommendation may be made by them at the next annual meeting. It is much-needed information.

There are at least two manufacturers that publish minimum diameters for various constructions as follows:

	Minimum Sheave and Drum Diameter in Inches		
	Mfr. A	Mfr. B	A.P.I. Specifications
3/4 in.—6x9 Seale	25 1/2	22 1/2	22 1/2
3/4 in.—6x21 Filler (6x16)	22 1/2	19 1/2	
3/4 in.—6x19 Warrington	22 1/2	18	22 1/2
3/4 in.—6x25 Filler wire	19 1/2	18	22 1/2
7/8 in.—6x19 Seale	29 3/4	26	26
7/8 in.—6x21 Filler (6x16)	26 1/4	22 3/4	26
7/8 in.—6x19 Warrington	26 1/4	21	26
7/8 in.—6x25 Filler wire	22 3/4	21	26

It is obvious that there is a material difference in flexibility between various constructions of the same size wire line with the same number of wires.

Few standard rigs have bull-wheel drums as large as 18 in. (the minimum for 3/4 in. line)—none with 21 in. or 30 in. bull-wheel drums. Some spudders have bull-wheel drums as small as 13 1/8 in. with sheaves, where reverse bends are made, as small as 25 in. From the standpoint of bending stresses it would appear, then, that the most flexible construction is the most desirable on all drilling equipment, and certainly quite important on spudders. This would be the 6 by 25 Filler wire construction formerly designated 6 by 19 Filler wire construction.

Other Cable-Tool Factors

Flexibility is not necessarily the only consideration. Resistance to wire breakage on the bull wheel, and resistance to abrasion in the hole are additional elements that must be considered and given their proper weight. Larger outside wires on a line best resist individual wire breakage on the bull-wheel drum. That is doubtless the reason the Seale construction is popular on rotary-drilling rigs. On cable tools, spooling can be controlled and it must be remembered that one broken large wire on a Seale construction line is much more serious than one broken wire on a Filler wire construction line because a high percentage of the total strength of the Seale construction is in the large outer wires.

As to abrasion, all constructions of wire lines commonly used for drilling, have the same amount of steel per hundred feet of line for each size. It seems logical to assume that abrasion from the hole will remove just as many pounds of steel from a given hundred feet of line of one construction as it will from another. The size of the outer wires would have little if anything to do with solving that problem as long as equal grades of steel are compared. Reasoning along these lines leads to the conclusion that coarse outer wires will not retard or reduce the rate or the amount of abrasion. The strength in any worn line is largely determined by the remaining steel in that line.

Selection of the kind of construction must be made from the standpoint of ability to resist bending, resistance to wire breakage on the bull wheels, and resistance to abrasion in the hole. The operator must

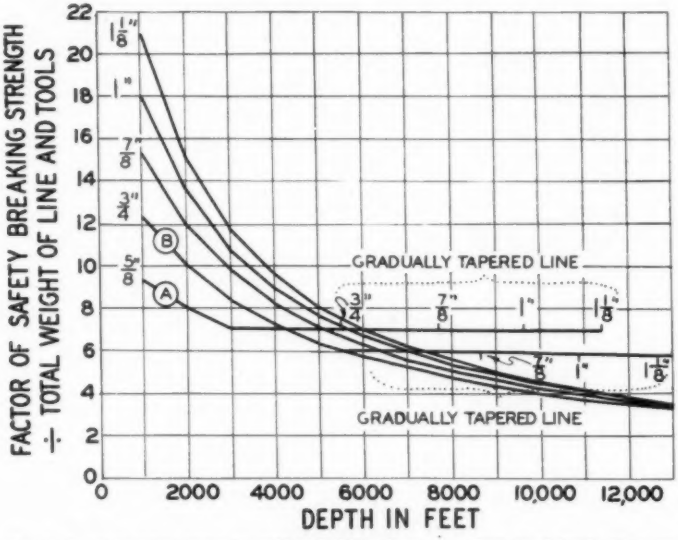


Fig. 1—Chart of safety factor for cable-tool drilling lines, as a function of depth. Data are for a 6-by-19 steel line (improved plow type), and weight of 3,000 lb. of cable tools (bit, stem, jars)

*Columbian Carbon Co., Charleston, W. Va. Paper presented before spring meeting, eastern district, American Petroleum Institute, Division of Production, Pittsburgh.

evaluate the importance of these elements on his job and select that construction that in his judgment best serves his particular job.

Safety Factors

The proper safety factor for any job is determined by experience and judgment. In drilling we can calculate the weight of the tools and line but the inertia loads, stresses from tools sticking, and the inumerable unexpected conditions are hard to evaluate.

Generally a larger factor of safety is required at the shallow depths of 1,000 to 2,000 ft. than is necessary at greater depths. The higher safety factor is required at shallow depths because if tools stick on the down stroke there is very little elasticity in the short length of line and greater strength is required to prevent breakage on the up stroke. The proper safety factor depends to a great degree on the care by the driller. If care is used to set the drilling clamps or brake on a spudder just tight enough to hold the tools the line will feed if the tools stick and a factor of safety of seven or eight would probably be sufficient. If such care is not taken the highest factor of safety obtainable is none too high.

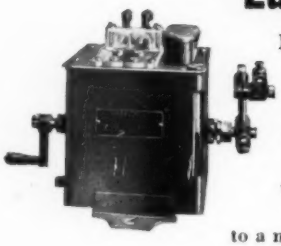
Experience seems to indicate that a factor of safety of six is about the minimum for greater depths if wire line trouble is to be avoided, and where possible a factor of seven is a better figure to work to. Sand lines are used on less severe service than drilling lines and a factor of five to six may be sufficient.

Tapered Drilling Lines

Drilling depths in excess of 6,000 ft. have been handicapped in the past by excessive wire-line failures, and wire-line cost is one of the largest items of expense in drilling deep holes. Improved plow-steel lines have helped but have not fully solved the problem. Referring to Fig. 1 it will be noted that with tools weighing 3,000 lb., a factor of safety of seven is reached for a ¾-in. line at 4,280 ft; for ⅞ in. at 5,000 ft.; for 1 in. at 5,700 ft., for 1⅛ in. at 6,000 ft. The safety factor is calculated from the dead-load weight of the line and tools at varying depths and does not take into account inertia loads, etc. We know we do not have too much wire-line trouble above 6,000 ft. so we can infer that so long as we operate our lines with a safety factor somewhere between six and seven we can expect to have little trouble. The chart brings out clearly that after 6,000 ft. is passed, it makes little difference what diameter line we use—trouble and costs will accelerate. Faced with this situation, the solution is to eliminate all unnecesary weight.

Tapered lines are not new. The first ones were made many years ago by splicing a small-diameter line to

Lubricators



Manufacturers serving the world-wide petroleum industry standardize on Manzel Force Feed Lubricators to make sure users of their machinery will receive long, economical, trouble-free service. Manzels supply all wearing parts with just enough of the right lubricating oil...cut labor costs to a minimum...reduce oil consumption to half that of hand feeding...prevent costly breakdowns.

Chemical Feeders

In pipe line, oil tank and bottom hole treatment, the various chemical compounds are automatically introduced in accurately measured quantities by Manzel Chemical Feeders. Sturdily built and simply designed, these feeders have an unsurpassed record for dependable, trouble-free operation.

•

Be sure to specify *Manzel* on your next installation...and write for helpful information about obtaining Manzels for your present equipment.

Manzel, Inc. now supplies repair parts for all models of Bowser and Torrington Lubricators.

Builders of HIGH PRESSURE METERING PUMPS Since 1898

Manzel INC.

336 BABCOCK ST., BUFFALO 10, N. Y.

a larger-diameter line but they were not satisfactory. Later, tapering was accomplished at the mill by brazing or welding smaller wires to larger wires when the line was fabricated. Early tapering was done over lengths of 50 to 150 ft. The taper was quite evident and rapidly wore at these points, and lines made in this manner were little better than the spliced tapers.

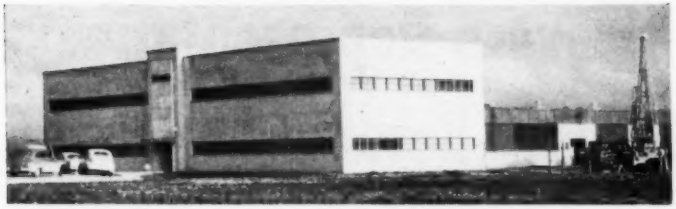
Today, the lines are tapered over almost their full length. Referring to Fig. 1 line designated (A) is fabricated with 2,900 ft. of uniform $\frac{5}{8}$-in. line. At that point the taper starts and gradually increases in diameter, at a uniform rate, until at the end of 11,400 ft. it has reached a diameter of $1\frac{1}{8}$ in. The line designated (B) is fabricated with 5,500 ft. of uniform $\frac{3}{4}$-in. line. At that point tapering starts and is continued at a uniform rate until it reaches a diameter of $1\frac{1}{8}$ in. at 13,000 ft. These two designs will permit a driller to use 3,000 lb. of drilling tools with line (A) to a maximum depth of 11,400 ft. and never work his line below a factor of safety of seven. Design (B) can be used with 3,000 lb. of drilling tools to a depth of 13,000 ft. and not drop below a factor of safety of six.

Tapers of these lengths wear evenly throughout and have been, and are now, giving the kind of performance that formerly could only be obtained at shallow depths. They have solved one of the serious cable-tool deep-well drilling problems. These lines are tailor made, engineered, and designed for the particular job required by the operator.

Two examples will illustrate the value of uniformly tapered drilling lines. One drilling line that started with $\frac{5}{8}$-in. line at the bottom and tapered to $\frac{7}{8}$-in. at 8,000 ft. was put on at a depth of 5,800 ft. and finished the well at 7,400 ft. The line worked in 5,000 ft. of uncased hole 104 days. Another line was a 10,000-ft. gradually tapered drilling line. It was put on at a depth of 8,150 ft. and taken off at 9,900 ft. because it was too short. It had been used 80 days in as much as 2,800 ft. of uncased hole. Such wire-line performance at these depths is unprecedented.

In addition to the durability of tapered lines, other dividends accrue with their use: horsepower savings are appreciable, spooling capacity is increased, machines designed for depths of 3,500 ft. can be, and have been used to drill to 7,000 and 8,000 ft. without materially overloading them.

Smaller-diameter portions of worn-out tapered lines make excellent sand lines for big bailers when starting new holes. The upper ends of the tapered lines are usually not worn badly when the line becomes too short for deep work and these portions are of ample size and length to start new holes. Nothing is wasted.



New $350,000 research laboratory which bears the blue "Sonoco" sign over its entrance

Sun Completes Base for Geophysical Operations

by Leigh S. McCaslin, Jr.

SUN OIL CO. has just completed a $350,000 building at Amelia, on the outskirts of Beaumont, Tex., to serve as a base for the geophysical operations of the entire company.

Research, development, and operational activity for the concern's widespread geophysical work in the United States and Canada will be directed from the new location. Work formerly carried on in several buildings in Beaumont and in a laboratory at Norwood, Pa., will be consolidated at Amelia.

Dr. C. B. Bazzoni is chief geophysicist of Sun with headquarters in Philadelphia, but with an office at Beaumont also. Activities of the 100 persons employed at the new geophysical building are supervised by L. G. Ellis, chief of the seismograph department, and John LaTouche, chief of the gravity and magnetic department. Seismograph department section heads are W. E. Hollingsworth, J. H. Sawyer, A. C. Winterhalter, R. W. Beard, and W. E. Lenhart, Jr. Joe P. Klein and W. E. James are gravity and magnetics department section heads.

The Sun company currently has in operation 16 seismograph crews, 8 gravity meter crews, and 1 magnetic crew. These crews are spread over a wide area extending from Texas to Canada and Florida to Wyoming.

The 22,500 sq. ft. of floor space in the new structure consists primarily of laboratory facilities for a staff of research engineers, shops for the construction and maintenance of apparatus and equipment, and facilities for a staff of interpreters and computers.

Research labs and shops are located on the first story of the building. Computing and interpreting of all seismograph records shot by field crews, with the exception of those in Wyoming and Canada, is done by trained personnel on the second floor.

One of the research labs specializes in the design and development of amplifiers for seismograph work. In another, researchers concentrate on

(Continued on page 111)

Collection of some of Sun's field equipment at new central base, including both heavy and light shot-hole drills, amphibious and slat-wheel-type marsh buggies, a pontoon portable drilling unit, surveying truck, jeep detector carrier, dynamite magazine, and shown at center rear a lily cutter

Left: W. T. Evans, research engineer, points out radar and associated equipment for offshore seismograph exploration. Right: Here five Sun employes are checking over a few lengths of detector cables, each 3,600 ft. long, used in Gulf of Mexico exploration

Electrodrill Recovers Representative Cores for Secondary-Recovery Projects

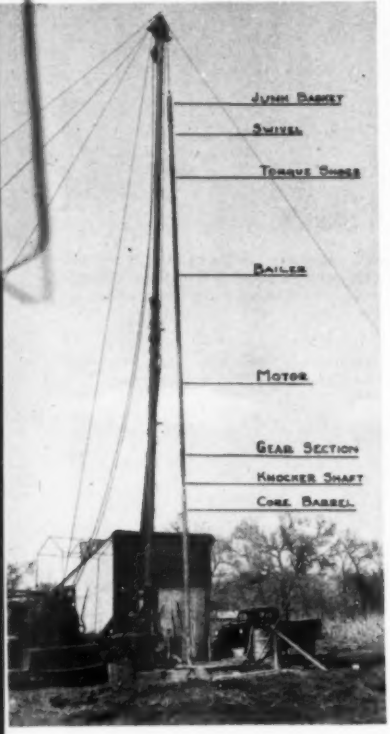
by A. Arutunoff*

REPRESENTATIVE cores are tangible evidence of what the rocks of an oil reservoir look like, that is, how they are stratified; what are the chemical and physical properties of each component, such as permeability in horizontal and in vertical direction; porosity, and what are the contents of the pores. In short, representative cores can give a definite answer to the important question: What is the minimum recoverable volume of oil to be expected per acre foot of stratum?

There would have been much more coring and much less straight drilling were it not for the fact that coring with conventional methods of rotary and cable tools costs considerably more than straight drilling. The new Electrodrill method was conceived for the purpose of reducing the existing gap between cost of coring and cost of drilling. To accomplish its purpose it combines the efficiency of rotary motion of the conventional rotary method with the economy of hoisting and lowering of the conventional cable-tool method. And it uses the diamond-core bit which, as is known, is capable of penetrating the hardest rock.

*Electrodrill Corp., Bartlesville, Okla. Paper presented at A.P.I. division of production, Pittsburgh, April 27-29.

Fig. 1—Electrodrill unit hanging from crown block of portable mast—field service unit. The different components of the subsurface Electrodrill assemblage are labeled



Briefly stated, the Electrodrill method consists in coring by an easily transportable, self-contained, electric-motor-driven unit which is lowered and raised in and out of the hole by a power cable. The drill unit contains a circulating pump and a bailer section into which the cuttings are deposited by the circulating liquid. The unit, beginning from the top, consists of the following sections (see Fig. 1): (1) junk basket; (2) swivel section which prevents the cable from being twisted by accidental rotation; (3) torque shoes which prevent backward rotation of the unit; (4) bailer into which the cuttings are deposited by circulatory liquid; (5) motor which provides the power for rotating the bit and circulating pump; (6) gear section, which contains circulating pump and reduction gearing; (7) knocker shaft on which the unit slides when raising until it hits the shoulder and breaks the core; (8) core barrel, with the bit.

Uses 17.5 Hp. Subsurface Motor

Although it can be built for smaller or larger casing sizes, only one size of the drill has been built so far, that is, the size to pass through 7-in. casing, cut 6⅛-in. hole, and to produce 3¾-in. core. The motor is 17.5 hp., 3,600 r.p.m., three phase, 60 cycle, 935 volt, for which electrical current is supplied by an engine-generator unit. The gear sections have two ratios and reduce the speed of the motor to 265 and 675 r.p.m. at the bit. The core barrel used is 8 ft. long so that the complete unit is accommodated by a 63-ft. mast of a truck-mounted winch.

All coring so far performed by Electrodrill had been done by use of diamond bits of the insert type. The rate of rock penetration was highest for sandstones, considerably lower for limestones, and lowest for shales which have a tendency to gum up the bit. In the first 50 wells cored, the diamond core bit obtained the following average rates of penetration: at 265 r.p.m., in shale—7 ft.; in sandstone—12.5 ft. per hour. At 675 r.p.m., in shale—9.3 ft.; in sandstone—26.5 ft. per hour. The record rate so far reached was in Bartlesville water sand when at 675 r.p.m. a 7-ft. section was cored in less than 7 minutes. The cost of diamond bits for coring with this method, which cuts a hole of 6⅛-in. diameter and produces a core of 3¾-in. diameter, has averaged 80 cents per foot of core.

Although the low rate of penetration of shales is a drawback which must be corrected, it has not proved to be a great disadvantage for reason of the fact that shale thicknesses to be penetrated form, in general, a small part of total thickness of rocks being cored. One redeeming feature of the slow progress of the diamond core bit working in shale is that the wear of the diamonds is negligible when the shale contains little sand. If the shale contains sand, the wear becomes greater but the rate of penetration increases also with the increase of sand content of the shale.

Perhaps it will not be out of order here to discuss briefly what the concept of "good coring" and a "good core" implies. The purpose of coring is to supply correct information of underground rock substances and materials for analysis. Good coring is an operation approximating 100 per cent core recovery. A good core is one which is uncontaminated with the drilling fluids and which approximates its natural state at the depths from which it was taken (as to water and oil content, with proper regard given for the effects of the change of ambient pressure from rock pressure to that of atmosphere). A coring operation which results in substantially less than 100 per cent of core recovery of a cored section will give, at the best, only fragments of knowledge desired when guess must substitute for the pieces of core lost.

For producing uncontaminated cores, the method has the advantage of coring under substantially the same pressure as that which prevails in the substance cored. Only sufficient liquid is required in the hole to cover the unit—a matter of 60 to 100 ft., although it can operate under any head of liquid. When coring in cased

quality by SO_2

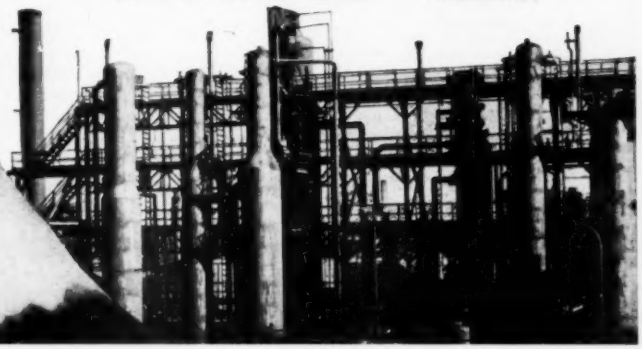
Extraction by liquid sulphur dioxide provides the only solvent process which refines all fractions of mineral oils. First used for the production of high grade kerosenes, the Edeleanu process has been adapted by Badger to the refining of other distillates for new uses, including improved methods of producing pure aromatics, transformer oil and high cetane diesel fuels.

SO_2 SO_2 SO_2 SO_2 SO_2 SO_2 SO_2

With the supply trend toward crudes of more difficult refining characteristics, industry is turning more and more to this means of retaining or improving product quality.

This is another example of Badger's contributions to modern petroleum processing. The ability to originate and develop new ideas and to adapt proved methods to new problems is an integral part of Badger's service to the petroleum, chemical and petro-chemical industries.

E. B. BADGER
& SONS CO. • Est. 1841
A SUBSIDIARY OF STONE & WEBSTER, INC.
BOSTON 14
NEW YORK SAN FRANCISCO LOS ANGELES LONDON
Process Engineers and Contractors for the Petroleum, Chemical and Petro-Chemical Industries



holes or where there is no upper water it is a simple matter while coring to keep the pressure of head of liquid in the hole equal to the pressure of rocks being cored, by coring under whatever head of liquid is in the hole and compensating from above for the amount withdrawn in the bailer section at each trip.

It was expected that when coring low-pressure sands, the question of kind of liquid to use to prevent contamination of the cores would largely solve itself, in that water could be used instead of oil or oil-base mud. The analysis of the cores taken from the same well with oil as a drilling fluid in one instance, and with water in the other, indicates that when there is no driving force or pressure differential there is no appreciable contamination.

In connection with the question of core contamination I quote from the paper presented at the recent spring meeting of the Mid-Continent District of A.P.I. under the title of "Prediction of Secondary Recovery From Core Analysis"*: "It now seems apparent that the problem of flushing is largely the result of loss of oil due to gas expansion rather than washing or flushing of the core by the coring medium. Introduction of the Electrodrill as a method of coring appears to be a big step forward in securing of unflushed cores from depleted sands." In conclusion, it may be said that when equipment becomes available for the Appalachian region, the application of it in secondary recovery operations of depleted areas may conceivably be of benefit from the quality of core taken by Electrodrill method even beyond the benefits accruing from relatively lower coring cost.

*Paper by R. C. Earlougher and J. M. Robinson.

Prompt Delivery on

STEEL BUILDINGS

• *Custom Built* • *Insulated if Desired*

- Structural Steel Fabrication
- Gratings
- Ladders
- Platforms
- Safety Cages
- Ventilators

Allied Steel is in a position at the present time to furnish *prompt delivery* on Steel Buildings, Structural Steel Fabrication and Steel Accessories.

Allied will completely engineer your special building requirements from analysis of your need to placing the last piece of steel.

Allied buildings can be furnished insulated; they are flexible, can be lengthened or shortened; afford nearly 100 percent salvage; are portable; have low initial investment and low cost maintenance; are fire resistant and weathertight.

ALLIED PRODUCTS STEEL

WRITE FOR ALLIED'S CATALOG

ALLIED STEEL PRODUCTS CORP.

2112 North Lewis Ave. Tulsa, Oklahoma

Shell Oil Completes Plant Expansion

(Continued from page 67)

agers, who are directly responsible to the vice president in charge of manufacturing. Coordination of major activities relating to operations, development, and engineering at all of the plants is achieved through separate departments in the home office whose managers are also responsible to the vice president in charge of manufacturing.

Contractors involved in the $50,000,000 expansion program are: Fluor Corp., C. F. Braun Co., M. W. Kellogg Co., Stone & Webster, R. P. Farnsworth Co., Harold Van Buskirk, and Industrial Construction Associates.

PRINCIPAL PRODUCTS OF SHELL CHEMICAL CORP.'S DEER PARK PLANT AND THEIR USES

Compound—	Formula	Molecular weight
Acetone	C_3H_6O	58.08

Solvent and extractant for a large number of fats, oils, gums, natural and synthetic resins and cellulose derivatives. Also used as a solvent in the manufacture of rayon, airplane dopes, fabric coating compounds, paint and varnish removers, cleaning compounds; in the production of penicillin and in the storage of acetylene in cylinders.

Acrolein	C_3H_4O	56.06

Offers an almost unlimited number of reaction possibilities for the synthesis of heterocyclic ring compounds, polybasic acids, diamines, alcohols, acetals, and more complex derivatives. Also used as an intermediate in the preparation of polymerizable monomers. Also a raw material for aldehyde type resins such as those obtained by condensation with phenol.

Allyl alcohol	C_3H_6O	58.08

Versatile chemical intermediate. Direct allyl alcohol derivatives include oxidation and reduction products, chlorohydrins, ethers, polymers, and esters of a variety of organic and inorganic acids. Resinous polymers are among its most important derivatives. Esters of dibasic acids, or of acids containing conjugated double bonds, readily polymerize in the presence of suitable catalysts. These polymers vary from viscous liquids to clear, hard thermosetting resins.

Allyl chloride	C_3H_5Cl	76.53

Chemical intermediate which reacts readily either through the chlorine or the double bond. Replacement of the chlorine leads to a variety of compounds having widely different structures. The double bond can be reacted with many reagents to give products useful in the synthesis of pharma-

ceuticals, anaesthetics, and a large number of chemicals.

Compound—	Formula	Molecular weight
Diacetone alcohol	$C_6H_{12}O_2$	116.16

Furnishes blush resistance and promotes the flow and leveling of nitrocellulose and cellulose acetate lacquers. It is an ingredient in hydraulic brake fluids, in fungicides for preserving exposed wood, and in preparations for removing ink from printing press rolls.

Epichlorohydrin	C_3H_5OCl	92.53

Valuable as an intermediate for organic syntheses. Epichlorohydrin has been successfully used as an intermediate by manufacturers of adhesives, dyestuffs, plasticizers, cosmetics and pharmaceuticals.

Glycerol dichlorohydrin	$C_3H_6OCl_2$	129.02

Starting material in the manufacture of synthetic resins, dyes, fine chemicals, surface-active agents, pharmaceuticals, cements, and adhesives.

Hexylene glycol	$C_6H_{14}O_2$	118.17

Useful in formulating hydraulic brake fluids, printing inks, industrial cleaning compounds, polishes, soluble oils, and prespotting soaps, and for treating such materials as leather, paper, and textile fibers.

Isopropyl alcohol	C_3H_8O	60.09

Used as a latent solvent in nitrocellulose lacquers and as an active solvent in phenolic resins. As a coupling agent, it is employed in industrial cleaning compounds, hydraulic brake fluids, and in the manufacture of soluble cutting oils. Also highly suitable as a dehydrating agent. Other solvent uses include the preparation of germicides, pharmaceuticals, cosmetics, and employment in solvent extraction processes. As an intermediate, isopropyl alcohol is used in the synthesis of the acetate ester, in the manufacture of lubricating oil additives, and in the preparation of the xanthate derivative which is a collector in ore flotation.

Isopropyl ether	$C_6H_{14}O$	102.17

A solvent for ethyl cellulose, oil, and certain resins and waxes, and is a latent solvent for nitrocellulose.

Methyl ethyl ketone	C_4H_8O	72.10

Highly effective low-boiling nitrocellulose solvent. Its use permits formulation of lacquers of higher solids content for a given viscosity than obtainable with other solvents of similar evaporation characteristics. As a solvent for resins of the vinyl type, methyl ethyl ketone is employed in the production of lacquers designed to exhibit good chemical resistance. It also finds application as a solvent for adhesives and cements based on Buna-N type synthetic rubbers.

Methyl isobutyl carbinol	$C_6H_{14}O$	102.17

Promotes gloss, leveling, and flow in nitrocellulose lacquers. Starting material in the manufacture of nitrocellulose plasticizers and other derivatives such as methyl amyl acetate and methyl amyl xanthate. It is also used as a frother for ore flotation.

Methyl isobutyl ketone	$C_6H_{12}O$	100.15

Employed as a medium-boiling solvent in nitrocellulose lacquers and lacquer thinners as well as in coating materials based on vinyl type resins. It is also used as a denaturant for ethyl alcohol, as a constituent of germicides and fungicides, as a solvent of phenolic resins, and in the manufacture of antibiotic agents, rubber cements and adhesives.

Compound—	Formula	Molecular weight
Mesityl oxide	$C_6H_{10}O$	98.14

Used primarily as a medium-boiling solvent for vinyl type resins and nitrocellulose.

Secondary butyl alcohol	$C_4H_{10}O$	74.12

Employed as a latent solvent in nitrocellulose lacquers to promote leveling and gloss. It is an ingredient of hydraulic fluids and is also used to prepare secondary butyl xanthate, an ore flotation agent.

Ethyl alcohol	C_2H_5OH	46.07

As a solvent for shellac, varnish, lacquer and laminated resins, in cosmetics and lotions, in the manufacture of D.D.T., as an extraction solvent in chemical manufacture, in the manufacture of photographic film and emulsion, and as a solvent for dyestuffs and plastics.

Compound—	Formula	Molecular weight
Ethyl chloride	C_2H_5Cl	64.52

A chemical intermediate.

Glycerin (synthetic)	$CH_2OH—CHOH—CH_2OH$	92.09

Manufacture of alkyd resins for use in paints, enamels, lacquers and other surface coatings. Also cellophane, explosives, food processing and preparation of various pharmaceuticals.

1,2,3-Trichloropropane	$C_3H_5Cl_3$	147.44

Used as an extractant, cleaning agent for

THOMAS Flexible COUPLINGS

ALL METAL

SPECIFIED WHEREVER 100% DEPENDABILITY IS DEMANDED

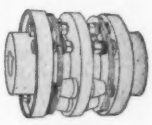
Refiners specify Thomas "Flexible" Couplings for PUMPS, COMPRESSORS, COAL PULVERIZERS, COOLING TOWERS and GENERATOR SETS.

TYPE DBZ-C

Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.

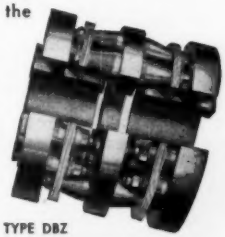
TYPE CM

Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.



TYPE DBZ-B

In the Laboratory Thomas "Flexible" Dynamometer Couplings assure the greatest accuracy.



TYPE DBZ

Thomas Flexible All-Metal Couplings Have No Wearing Parts. BACKLASH, FRICTION and CROSS-PULL ARE ELIMINATED.

NO LUBRICATION IS REQUIRED!

Write for the new Engineering Catalog

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

internal-combustion engines, an ingredient of paint and varnish removers and in insecticidal fumigants. As an intermediate, trichloropropane can be reacted with salts of organic acids and phenols to give esters and ethers respectively, or with cyanide salts to give aliphatic nitriles and polynitriles.

Slaughter Gasoline Plant Outstanding

(Continued from page 73)

content of the raw gasoline to odorless and noncorrosive disulfides.

A solid desiccant dehydration unit is provided for propane drying.

Fractionation System

The treated product stream is heat exchanged with the debutanizer bottoms and pumped into the 36-tray 7 ft. by 62-ft.-6-in. depropanizer. Commercial propane is produced overhead from this column and flows to storage through a sand filter and solid desiccant dehydration unit. Design operating pressure of the depropanizer is 240 psig. The depropanizer bottom stream feeds the 40-tray 6-ft.-6-in. by 68-ft.-6-in. debutanizer which normally operates at 75 psig. A commercial butane product is produced overhead and flows through a product cooler to storage. Natural gasoline, which may range in vapor pressure from 12 to 36 lb. R.v.p., is produced as a kettle products. It exchanges heat with the depropanizer feed and flows through a cooler to storage.

Storage and Loading Facilities

Product storage has been installed for approximately 5 days' production when processing 90,000,000 cu. ft. per day. There are three 12 by 120-ft. horizontal tanks for propane storage, five of the same dimensions for butane, two 7,500-bbl. spheroids for gasoline, and two 10 by 70-ft. gasoline rundown tanks.

Storage is also provided for 60,000 bbl. of well water, 2,000 bbl. of lean oil, 1,000 bbl. of heat medium oil, and 1,000 bbl. of boiler feed water. There is smaller capacity storage for caustic solution, amine, sulfuric acid, and lube oil.

Truck and rail loading facilities are provided at the plant site.

Utilities

In order to hold the steam-generation requirements to a minimum, essentially all of the process heating load is supplied by a hot-oil heat medium system. Virgin gas oil is circulated through two direct-fired heaters, rated at 60,000,000 B.t.u. per hour each, to the various process heat loads. Under design conditions, the heat medium oil leaves the direct-fired heaters at 550° F. and returns at 360° F.

Process cooling water is circulated over a 20,000-g.p.m. induced-draft cooling tower. Under design conditions cold water is pumped from the basin at 80° F. to shell-and-tube exchangers for process, interstage gas, jacket water, and lube-oil cooling. Water returns to the cooling tower at 120° F.

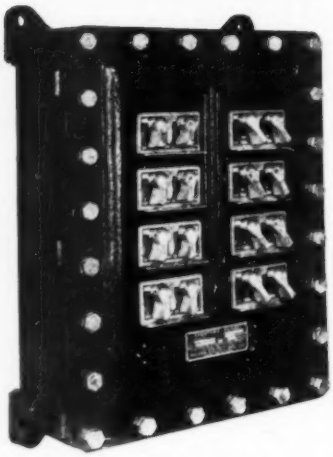
Raw water is supplied to the plant by four 500-g.p.m. wells located on the plant site.

Electric power is furnished by six 800-kw. 2,300-volt 3-phase generators, each driven by a 1,200-b.p.h. (nominal sea level rating) 4-cycle engine.

Steam is supplied at 300 psig. by two gas-fired water-tube boilers, one of which is standby. Each boiler is rated at 30,000 lb. per hour. Normal steam demand for a 90,000,000-cu.-ft.-per-day processing rate is about 22,400 lb. per hour. Most of this steam is used to drive the heat medium pump turbines which exhaust into a 125-psig. steam system. Steam from this system is used for process stripping, and in the diethylene glycol reboiler and regenerative caustic preheater. Several small turbines are driven by 300-psig. steam and exhaust at 10 psig. into the hot process boiler feed water treater.

The cold lime-soda process is used to treat cooling water makeup. Facilities are also provided for stabilization by addition of sulfuric acid and for chlorination of the cooling

Highly Endorsed by Engineers and Field Men!



At left is shown Nelson Class 411 Explosion Proof Lighting Panel — 16 circuit enclosure, single pole.

•

Designed to provide branch circuit protection for electrical circuits in hazardous locations, the Nelson Explosion Proof Lighting Panel offers a number of features that are highly endorsed by engineers and field men. Among these features are—

- Excellent Design. Compact in size, yet having ample wiring space.
- Quicklag Circuit Breakers provide faster opening action on short circuits, and full time delay on overloads. Additional breakers can easily be added in the field.
- Several conduit combinations are available; and many single pole circuit combinations.
- Corrosion-resisting operating shafts and mechanism.
- Two sizes of enclosures — 8 and 16 circuits, single pole.
- Designed for Class 1, Group D Hazardous Locations. Can also be used in Class 2, Groups E, F and G, and Class 4 Locations. Write for Bulletin 411.

NELSON *Electric* MANUFACTURING CO.

217 North Detroit TULSA, OKLAHOMA Telephone 2-5131

Manufacturers of: Explosion Proof Motor Controls, Junction Boxes and Enclosures, Circuit Breakers and Lighting Panels, Oil Field Motor Controls, Automatic Pipe Line Sampling Devices, Cathodic Protection Equipment, Switchboards, Instrument and Control Panels, Unit Substations.

tower water to control algae and slime.

Waste-disposal facilities include two 50 by 250-ft. settling basins, a burning pit, an evaporation pit, a flare stack, and an acid-gas stack.

Buildings

Eight buildings are in the plant area. These include two compressor buildings, one 33 by 372 ft. and one 33 by 228 ft.; a 53 by 170-ft. generator building; a 50 by 90-ft. shop and warehouse; a water treating and chemical storage house; a fire-water pump house; a laboratory, and an operators' shelter. The large buildings are of steel rigid frame construction. The smaller miscellaneous buildings are truss-type construction. The roof and walls of all buildings are galvanized corrugated iron. The office building is of frame construction and is located outside the plant area.

Sun Completes Base for Geophysical Operations

(Continued from page 105)

seismograph geophones. Problems connected with seismograph operations in the Gulf of Mexico occupy the attention of those in one lab. Instrument equipment for seismograph trucks is the specialty of still another lab.

In the research lab devoted to offshore operations, much time is being devoted to methods of accurately locating seismograph shots. Two electronic devices developed during the war—radar and shoran—have been applied to this problem. Modifications have been made to war-time radar and shoran to adapt them to oil exploration work.

Seismograph detectors are assembled and tested in a shop set aside for that specific purpose. This shop also repairs and tests detectors which have been in use by field crews.

Detector cables are made from wire manufactured to Sun specifications, in another shop. The special electrical outlets necessary for this work are also installed on the cables. For exploration work in the Gulf of Mexico, 3,600-ft.-long cables with 14 detectors are used. Sun has carried on work in the gulf as deep as 70 ft. and as far as 75 miles from shore.

Amplifiers are also assembled for field use in a special shop. In the instrument truck room, the various pieces of seismograph equipment are mounted and installed on the instrument trucks. In addition, the field trucks are returned to this room periodically to be repaired and checked.

A complete shop setup and a warehouse are maintained to service the various laboratories and assembly shop in the building. They are located in the back wing which has 11,200 sq. ft. of floor space. Shops include a main machine shop, welding shop, carpenter shop, and a small machine shop.

All offices and laboratories in the new building are completely air conditioned. Austin Co., of Cleveland, designed and constructed the building.

BOOKS

PATENT LAW FOR THE EXECUTIVE AND ENGINEER. By Harry A. Toulmin, Jr. Published by Research Press, Inc., Dayton. 231 pp. $2.95.

This volume of 20 chapters is a veritable "how to" treatise on patents. How to get a valid patent, how to keep invention records, how to stimulate invention by employes, how to avoid patent infringement, how to determine when a development is an invention—these are only a few of the subjects discussed. Many great industries and many more small ones have had their origins in patents. They have been protected by patents, and built upon patents. The author, a corporation lawyer, has represented many concerns in patent work.

HOW TO KEEP INVENTION RECORDS. By Harry A. Toulmin, Jr. Published by Research Press, Inc., Dayton. 78 pp. $2.50.

This volume, by the same author as the above-mentioned book, tells how to protect patent property by showing how to keep records to protect one's rights, such as date of conception, date of disclosure to others, reduction to practice by test and experiment, proof of ordering materials for first-run production. It tells the difference between a patent, design patent, and trade mark.

NO REPLACEMENT PROBLEM HERE...

with TRANSITE PIPE on the job in this Salt Water Disposal Line

HERE IS ANOTHER Transite* salt water disposal line that will soon be saving money. Frequent pipe replacements will be eliminated because Transite Pipe, made of asbestos and cement combined by a special process, fights corrosion two ways. It resists the corrosive action of salt water on the *inside*... corrosive soil on the *outside*.

You get other advantages, too, with Transite Pipe. Light in weight, it is easy to handle. Most sizes can be unloaded and lowered into the trench without the use of mechanical handling equipment. And Transite's factory-made Simplex Couplings speed assembly... provide *tight* yet *flexible* joints that permit laying the pipe around curves without special fittings.

*Reg. U. S. Pat. Off.

For further details, address Johns-Manville, Box 290, New York 16, N. Y.

Johns-Manville
TRANSITE PRESSURE PIPE

Comfort that pays for itself...

Many times over

The *Improved* WILLSON LEATHER MASK SAFETY GOGGLES

The mask of high grade, soft, pliable leather fits any face and head size. And it distributes the shock of impact over a wide area. Fitted with WILLSON Super-Tough* lenses, of course, for maximum eye protection.

for Dusty Jobs

Style DL48

Indirectly ventilated with four baffled and screened ports in the eyecups. They permit the entrance of air— exclude dust, grit and other flying particles.

for Hot Jobs

Style DL31

Deep eyecups are well perforated to permit free air circulation to reduce fogging. Corduroy bound edges absorb perspiration. Particularly adaptable for men working under high temperature conditions in many foundry and steel mill operations.

For more complete information about these and other WILLSON eye and respiratory protective equipment, get in touch with your Willson distributor or write us direct.

WILLSON*

"Established 1870"

*T. M. Reg. U. S. Patent Office

WILLSON PRODUCTS, INC., 246 WASHINGTON STREET, READING, PA.

AMMONIA
(Refrigeration Grade)

TANK CARS and CYLINDERS

direct service from producing point to user available on contract shipments or spot orders from...

SPENCER

SPENCER CHEMICAL COMPANY
Executive and Sales Offices
611 Dwight Building
Kansas City 6, Missouri

CONTACT SPENCER NOW FOR YOUR AMMONIA NEEDS

ENGINEERING *fundamentals*

Oil Displacement by Gas and Water

OIL must be produced from a reservoir by some type of driving energy. The space vacated by the produced oil and its accompanying gas must be then occupied by some other fluid. The fluid which takes the place of the produced oil and gas may be water or it may be more gas, depending upon the nature of the driving energy. The process of the driving fluid occupying the pore space formerly held by reservoir fluids is generally termed displacement. In order to formulate expressions for rate of oil production, efficiency of displacement, and the amount of displacing fluid to be handled, it is of interest to inquire into the manner by which oil is displaced by either gas or water.

It is generally acknowledged that there is a fundamental difference between gas displacement and water displacement. This has resulted primarily from empirical observations rather than from a theoretical analysis. The general observation has been that water will displace oil in a piston-like fashion but that gas will not. Consequently in displacing oil with water from a homogeneous section, the oil is produced virtually free from water, but when water does break through oil is no longer produced. Thus, in a water drive, it is common to speak of a flood front as a definite line of demarcation between the oil and displacing water.

In displacing oil from a homogeneous section with gas, on the other hand, very little oil is produced free from the displacing gas, and as production ensues, more and more of the displacing gas is carried through. Thus, gas displacement is not generally thought of in terms of a flood front, but is described as a dragging action rather than a pushing action.

Actually, Buckley and Leverett[1] have given a more complete analysis of the displacing process, indicating in effect no fundamental difference between the descriptions of displacement by either gas or oil. Their analysis is supported by the use of relative-permeability data. These authors describe any displacement as consisting of two phases—the primary phase and the secondary phase.

During the primary phase of displacement, the oil is produced by a pushing action, whether it be by gas or oil. The primary phase is ended when the displacing phase shows up in the producing stream. During the secondary phase of displacement, there is a simultaneous flow of both oil and the displacing fluid, in which period the oil can be considered to be dragged along by the displacing fluid.

Primary Oil Production

The differentiation between gas displacement and water displacement then becomes based upon the relative magnitudes of the primary and secondary phases of displacement. It is common in water displacement to find that production of oil during the primary phase accounts for almost the entire ultimate cumulative production and that the secondary phase is relatively unimportant. It is common in gas displacement to find that the production of oil during the primary phase is minor and that the majority occurs during the secondary phase of displacement.

The above generalized statements must, of course, be modified to account for other variables, two important ones of which are the pore geometry of the reservoir material and the viscosity ratio between the displaced oil and the displacing fluid.

The effect of viscosity can be best understood by reference to a single capillary. By the principles of viscous flow it is known that the fluid velocity at the center of a capillary is a maximum and at the wall is zero. Thus, when attempting to displace from a capillary a viscous fluid by one that is less viscous, the tendency is for the displacing fluid to take the path of least resistance at the center of the capillary and penetrate much as a bullet would down the central portion of the capillary. The greater the viscosity difference between the displaced and displacing fluids the more pronounced this effect would be.

On the other hand, consider the reverse situation where the viscosity of the displaced fluid is less than that of the displacing fluid. The fluid being displaced, being more mobile than the displacing fluid, does not permit the center penetration of the latter and there is a definite line of demarcation between the two. Thus, as the viscosity ratio of displaced fluid to displacing fluid goes up, the definite line between the two fluids becomes less and less pronounced.

In the case of the displacing fluid viscosity being less than the displaced fluid viscosity, therefore, there could be a small primary phase of displacement and a large secondary phase. Where the viscosities were reversed there could be a large primary displacement and a very small secondary phase displacement.

On the basis of this approach a water displacement might behave as what is generally accepted as a gas displacement (i.e., minor primary phase, major secondary phase) provided the ratio of oil viscosity to water viscosity were so high as the usual oil viscosity to gas viscosity. Conversely, in the displacement of a rich condensate by a recycle gas where the viscosity ratio of displaced fluid to displacing fluid is considerably lower than the usual oil to gas viscosity, the displacement might look very similar to what is accepted as a usual water displacement (i.e., major primary phase, minor secondary phase).

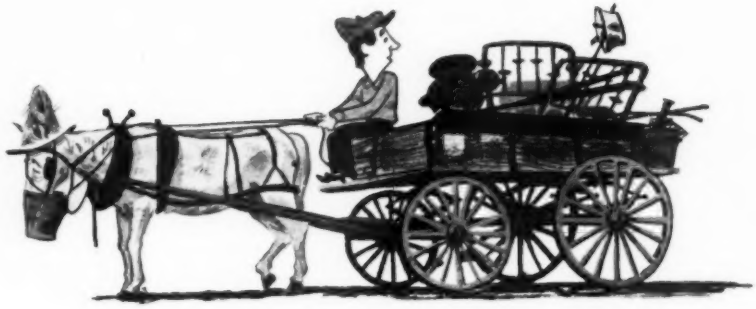
These remarks apply strictly, of course, to a homogeneous bed. The displacement in a formation which is not homogeneous would require a modification of the approach indicated. In calculating water flood displacement some success has been obtained by treating a heterogeneous formation as a sum of small homogeneous beds in parallel with a piston-like displacement of oil by water.

Reference

1. Buckley and Leverett, Mechanism of Fluid Displacement in Sands, A.I.M.E. Trans. 1942, Vol. 146.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

Nobody throws away Stainless Steel



Stainless steel *lasts.* Allegheny Metal stays bright and strong —gives lifetime service—under conditions of corrosion, heat and wear that send lesser metals to the junk-pile in a few years, or perhaps only months. Wherever a superior metal will give you advantage, you'll find it cheapest in the long run to use Allegheny Metal, the time-tested stainless steel.

Complete technical and fabricating data—engineering help, too—yours for the asking.

ALLEGHENY LUDLUM STEEL CORPORATION

The Nation's Leading Producer of Stainless Steel in All Forms

Pittsburgh, Penna. . . . Offices in Principal Cities

Allegheny Metal is stocked by all Jos. T. Ryerson & Son, Inc., Warehouses

Cost-imating

A WEEKLY FEATURE OF THE OIL ANG GAS JOURNAL

Electrical Equipment

THE costs of electrical motors and transformers were indicated in Cost-imating Nos. 30 and 31 (May 12 and 19) and the yearly indexes for electrical equipment were shown in Cost-imating No. 31.

Power plants in refineries vary widely in cost but averages are shown in Table 1. Also included in Table 1 are the costs of small engine-driven generators housed in corrugated steel buildings. Finally, Table 1 also shows the complete costs of engine-driven power-generating units used for oil-field service. Some of these units are on skids whereas others are set on permanent foundations. The units are housed in steel mill-type buildings, or they are fabricated from corrugated sheet iron and wood frame. Such costs are probably 10-15 per cent lower than the cost of a similar generating unit installed in a refinery. The cost of boilers was indicated in Cost-imating No. 25, Pipe Stills (April 7, 1949). The steam required to generate 1 kw. is 25-30 lb. when maintaining a low back-pressure.

The approximate complete cost of power lines is shown in Table 2, and a few miscellaneous equipments are indicated in Table 3.

TABLE 1—APPROXIMATE COST OF ELECTRICAL POWER-GENERATING PLANT

(Dollars per kilowatt, 1946)

Type of plant—	Material and labor ($ per kw.)	Ref.
Petroleum refineries (85 plants)	150	1, 2
Petroleum refineries at process steam pressures	157	1
Petroleum refineries, high pressure	125	1
Petroleum refineries, average	125-157	1, 3
Electrical complete but no steam plant	105-115	3
Public utilities, average	300	1
Public utilities, serving refineries	175 up	1
Public utilities, serving large industrial plants	200	1
Small engine driven complete, for oil-field service:*		
20 kw.	235	4
60 kw.	135	4
100 kw.	118	4
140 kw.	107	4
Large engine driven complete, for oil-field service:*		
400 to 2,600 kw.	125	4

*Probably 10-15 per cent cheaper than for refinery installations.

TABLE 2—APPROXIMATE COST* OF ELECTRICAL LINES ($/MILE) COMPLETE WITH POLES, ETC. (1946)*

Type of line—	Wire	Material*
13,200-volt, 3-phase	No. 2/0 copper	$2,250
2,300-volt, 3-phase	No. 1/0 copper	$1,750
2,300-volt, 3-phase	No. 2 copper	$1,250
2,300-volt, 3-phase	No. 4 copper	$1,050
2,300-volt, 3-phase	No. 6 copper	$ 925
2,300-volt, single	No. 6 copper	$ 800
2,300-volt, 3-phase	No. 1/0 aluminum	$1,250
440, 220, or 115 single or double		$1,250
Telephone, in refinery		†$2,000

*The labor cost is equal to the material cost. †Material and labor.

TABLE 3—MISCELLANEOUS ELECTRICAL EQUIPMENT—1946 COSTS

Equipment—	Unit	Material	Ref.
Conduit, rigid, galv. 1 in.	ct./ft.	16	3
Conduit, rigid, galv. ½ in.	ct./ft.	7.6	3
Cable, 600-volt, lead covered, No. 9, 3/c	$/M. ft.	280	3
Cable, 600-volt, lead covered, No. 4	$/M. ft.	600	3
Wire, black stranded, No. 8 RH, 600-volt	$/M. ft.	45	3
Wire, black twin flat, No. 16, 3/c	$/M. ft.	40	3
Lights, inside, std. industrial including fixtures, switch and line	$ each	*30-40	5
Lights, explosionproof	$ each	*80-100	5
Lights, outside, std. industrial flood	$ each	*300-500	5
Starter, motor, best quality, 10 hp.	$/hp.	20	6
Motor control box for oil-field service†	$ each	80	4
Telephone, installed	$ each	‡26	3
Telephone switchboard, 100 line, automatic	$ each	‡10,000	3
Telephone system for pipe lines	$/mile	‡650	7

*Labor costs are 150-200 per cent of the material cost.[6] †7½ hp. and smaller, fused disconnecting switch, magnetic starter with overload trips, time-clock control, lightning arrester—all in box. ‡Material and labor.

References

1. Ryan, William F., Design and Cost Factors, The Oil and Gas Journal, July 20, 1946, p. 97.
2. Progress of High Pressures in the Industrial Plant, Mech. Eng., June 1940.
3. Author's files.
4. Field, J. H., Electric Generating Plants, The Oil and Gas Journal, June 22, 1946, p. 106.
5. Happel, Aries, and Borns, Equipment Costs . . ., Chem. Eng., Dec. 1946, p. 97.
6. Tyler, C., Chemical Engineering Economics, 3rd Ed., McGraw-Hill Book Co., New York, 1948.
7. Davis & Terry, The Oil and Gas Journal, Jan. 1, 1931, p. 117.

No. 32 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

PROTECTION SERVICE
Covers Every Pipe-coating Need

Materials and Application Procedure for:

1. Water Industries
2. Natural Gas, Crude Oils and Products Transmission
3. Professional Application in Plants and Yards
4. Distribution Systems
5. Reconditioning Operations
6. Gathering Systems
7. Recycling Operations

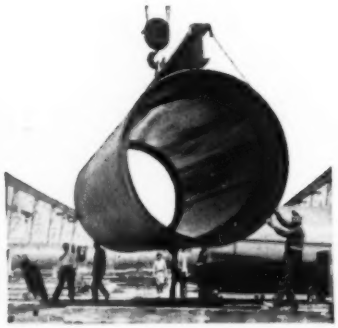
Materials and Application Procedure for
THE WATER INDUSTRIES

Barrett* Waterworks Enamels are manufactured specifically to fulfill the service requirements of the water industry. They neither flow nor sag in temperatures as high as 160°F.; nor do they crack in temperatures as low as 20° below zero.

Moreover, Barrett enamels possess sufficient flexibility and ductility to accommodate the "breathing" of the pipe, and to withstand the weight of the backfill when the pipe is not full of water.

When used to line the inside of a pipe, Barrett enamel prevents tuberculation, thus enabling the pipe to maintain its original capacity. The Hazen-Williams coefficient of flow can be increased from 100 to 150 by coating with Barrett enamel. Thus, 50% more water can be put through the pipe with the same expenditure of horsepower.

The Barrett organization will be glad to advise you on any pipe coating problems.



When Barrett enamels are used, no loss of bond occurs at the inter-faces of steel, primer and enamel.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

*Reg. U. S. Pat. Off.

OIL and GAS EQUIPMENT Digest

THE OIL AND GAS JOURNAL

offers this "Check It" service for the convenience of its busy readers who realize the need to keep informed on the many items of new or improved equipment that are continually being introduced.

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD

Permit No. 3A, 510 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL

BOX 1260

TULSA, OKLAHOMA

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD

Permit No. 3A, 510 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL

BOX 1260

TULSA, OKLAHOMA

KEEP INFORMED!

this EASY way

SAVE TIME

TEAR OUT CARD

CHECK IT

MAIL IT

THE OIL AND GAS JOURNAL

offers this "Check It" service for the convenience of its busy readers who realize the need to keep informed on the many items of new or improved equipment that are continually being introduced.

Keep informed on what is new in equipment that will work for increased efficiency and lower costs in your operations. *Save Time* by using only one card to get information on every item of interest to you. *Tear Off the card* below. *Check It. Mail It.*

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20)
(21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40)

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, May 26, 1949

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... **ZONE NO.** ..... **STATE** .....

NAME ..... **TITLE** .....

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20)
(21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40)

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, May 26, 1949

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... **ZONE NO.** ..... **STATE** .....

NAME ..... **TITLE** .....

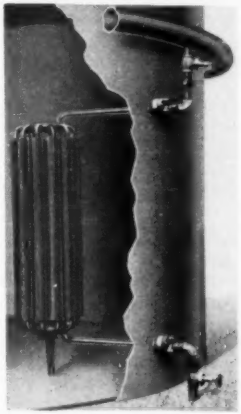
No Postage Required

OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

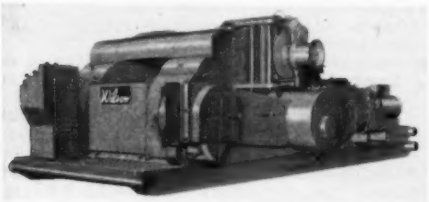
by Dan B. Miller

(1) THERMO-FLO TANK HEATERS will pass through a standard 20-in. manway with ample clearance. The vertical mounting practically eliminates depositing on the tubes and avoids the necessity of heating through a layer of sediment. Heaters set up a thermal siphon or "flow" within the tank, resulting in highly efficient heat transfer. Each lineal foot of fintube in the Thermo-Flo heater has the surface equivalent of 6 lineal feet of plain bare pipe. Can be installed singly or in groups. Fabricated from mild steel, stainless steel, Monel, Everdur, admiralty, or other metals, to meet individual conditions. *Brown Fintube Co.*



IT'S NEW CHECK IT

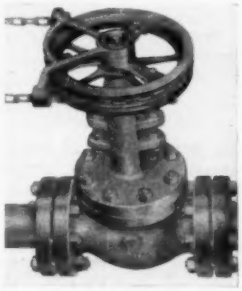
(2) ROADAIR GIANT. A compact rig measuring 12 ft. wide and capable of being moved in a single load. The



rotary rig is powered by two engines with a total input of 500 hp. and is rated to 7,500 ft. with 4½-in. drill pipe or 9,000 with 3½-in. pipe. The cathead shaft is arranged so that either plain or spinning-line catheads can be furnished on the driller's side and either automatic or breakout catheads can be used on the opposite position. A unique feature is the fact that, in case of air failure, low-speed clutches can be locked in position to come out of the hole. One engine will pull the pipe out of the hole from a 7,500-ft. bottom in such an emergency. *Wilson Manufacturing Co.*

IT'S NEW CHECK IT

(3) CHAIN WHEELS has long been considered the simplest, most direct and economical means of operating overhead valves. The company manufactures two types of chain wheels, the permanent type and the universal type, in a complete range of sizes. The permanent type, primarily for valves manufactured by the company, replaces the handwheel of the valve. It is used wherever a permanent installation is required. The universal-type illustrated wheel can be quickly attached to the rim of the valve's handwheel and is used wherever a low-cost, quick, or temporary, installation is needed. *Pacific Valves, Inc.*



IT'S NEW CHECK IT

(4) JUNKUP is a simple, trouble-free device which can save operators hours of lost time in trying to pull a tight tool which has been wedged by a piece of iron dropped on top of the tool. It is a molded rubber cup which may be fitted over the top of a packer. It is completely millable or drillable as added protection against loss of a hole. The rubber is oil, acid, and

wear resistant. Perforations in the cup give ample area for drain back and also prevent the Junkup from floating in the hole. *Houston Engineers, Inc.*

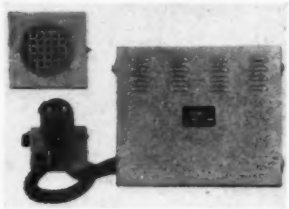
IT'S NEW CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

OIL AND GAS EQUIPMENT Digest — IT'S NEW — CHECK IT

(5) COMCO 275-C MOBILE FM TWO-WAY RADIO. Ruggedly built, compact F.M. radio receiving and transmitting units built specifically for mobile installations, e.g., oil-field and utility vehicles. Features extremely low battery drain which normally eliminates the necessity of oversize batteries and generators. Obtains clear signals at maximum range. Designed for adjacent channel operation. Simply constructed for quick, easy maintenance. Suitable for installation in all cars and trucks. Main station companion equipment is powerful, economical to operate and maintain. *Communications Co., Inc.*



IT'S NEW — CHECK IT

(6) BORING MACHINE developed during the last 2 years by pipe-line contractors on actual boring jobs, brings revolutionary progress in road boring to the pipeline industry. It is a single machine which will bore holes 3 to 30-in. diameter with an auger which may

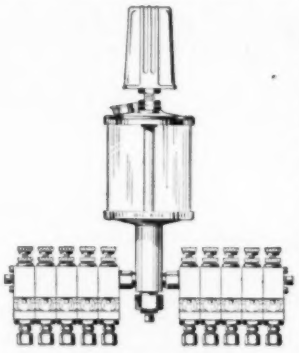
be any one of several types, a section of pipe, a water auger, or a spiral conveyor auger. Three men and the machine make a road boring crew. The machine is easily and quickly set up in any trench that is 28-in. wide and 10 ft. longer than the hole to be bored. *Utility & Industrial Supply Co.*

IT'S NEW — CHECK IT

(7) SUPER SPARK MAGNETS. The line includes magnetos for one, two, four, and six-cylinder small, medium, and heavy-duty engines and power units. Improvements include longer life breaker mechanism, larger bearings, improved rotor and improved timing facilities on the four-cylinder units. These magnetos are known as the FM-X type and supersede the former FM-J type of magnetos. Along with this line of magnetos, the company has developed a new universal impulse coupling. By use of this all-purpose coupling and one extra coupling hub, it is a simple matter to make literally hundreds of magneto specifications. *Fairbanks, Morse & Co.*

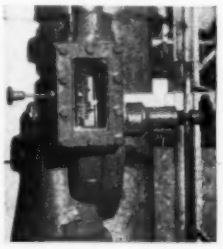
IT'S NEW — CHECK IT

(8) ELECTRO-OILER is entirely automatic in operation. Oil is released from the reservoir by a solenoid operated valve through a single or multiple sight feed valves to a number of individual bearings to be lubricated. Solenoid is connected across the line of the driving motor of the machine whose bearings are to be lubricated. When the motor switch is turned on, lubrication of the bearings starts immediately. The single reservoir will feed up to 24 bearings. Oil fed to each bearing can be conveniently and individually adjusted as well as observed at one station through the sight feed valves. *Oil-Rite Corp.*



IT'S NEW — CHECK IT

(9) AUTOMATIC TANK GAGES and remote-reading tank gaging equipment are available for many types of field and plant installations. Tests of this equipment made continuously for over a thousand complete pumping cycles (corresponding to emptying and filling of tanks for several months to years of normal usage) show accuracy to plus or minus 1/16 in. (Manufacturer recently completed a unique testing system for checking accuracy of these float-actuated automatic tank gages and remote tank gages. A tank gage mounted on a 30-ft. vertical section of 18-in. o.d. casing and paralleled by a calibrated gage glass afforded an absolute means of comparing automatic gage readings against actual liquid level readings.) *Vapor Recovery Systems Co.*

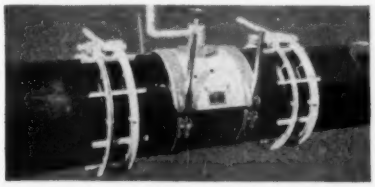


IT'S NEW — CHECK IT

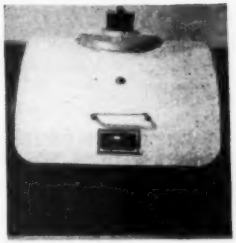
(10) KONCENTRIK FLARED TUBE FITTINGS. Produced in stainless steel, Koncentrik flared tube fittings are designed primarily for use in lines carrying highly corrosive liquids and gases or where operating shock and pressures are excessive. Engineered for maximum protection against leaks due to coupling failure. A patented floating seat that automatically adjusts itself to the tube flare insures true concentricity and full cycle, metal-to-metal contact because the seat is wedged into position as the tube nut is tightened. In addition, resilient Teflon rings act as an extra safety seal. These plastic bands, that are impervious to acids, compress into all surface irregularities when the fitting is tightened. *Special Screw Products Co.*

IT'S NEW — CHECK IT

(11) TIPTONS HIGH-PRESSURE PIPE-LINE PATCH is completely safe for use in repairing leaks on modern high-pressure pipe lines. The gasket of the patch seals

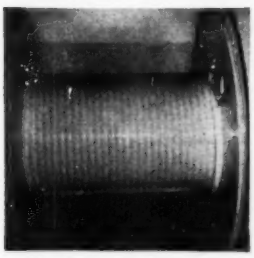


off the pressure and the venting plug permits venting away of gas, oil, or other fluids while the patch is being installed. The electric weld patch can be installed while line is in operation, saving fuel, work time, and shutdown time. Clamps hold gasket in place while stringer bead is applied. Clamps are then removed and welding completed. Vent plug is closed and vent line and jacket removed. Plug is sealed by welding. *General Manufacturing Co.*

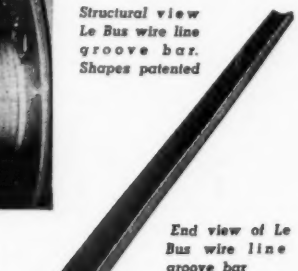


IT'S NEW CHECK IT

(12) WIRE-LINE GROOVE BAR, developed to cut the cost and improve performance of wire lines,



Structural view Le Bus wire line groove bar. Shapes patented



End view of Le Bus wire line groove bar

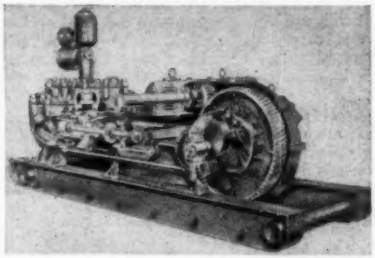
the wire lines groove bar has been designed to prevent pinching, squeezing, crowding, and mis-shaping. Bars are wider than the wire line for which they are made, thus costly side friction is eliminated. End fillers and bar have been sized and shaped to handle wire rope "with gloves" and guard it from unnecessary shock. Bar can easily be removed and another size applied when size of line is changed. Groove bars are made for all sizes of wire line regularly used in drilling or hoisting operations. *LeBus Rotary Tool Works, Inc.*

IT'S NEW CHECK IT

(13) COROMAT, new, high-strength Fiberglas pipe wrap for underground pipe lines is manufactured by Owens-Corning Fiberglas Corp. The new wrap is a porous mat of glass fibers reinforced with long, continuous strands of glass yarns. Yarns are made from fine, flexible, textile-type filaments of glass, designed to resist soil acids and electrolytic action. By incorporating the high-strength yarns in a multidirectional pattern, the tear strength of the basic Fiberglas pipe wrap has been increased 200 to 400 per cent. With breakage eliminated, 1,000 or 1,200-ft. rolls can be used, doing away with frequent machine stoppages to add new rolls. *Midwestern Engine & Equipment Co.*

IT'S NEW CHECK IT

(14) DUPLEX SLUSH PUMP features end-packed liners adjusted from outside the fluid end, tool steel gear and



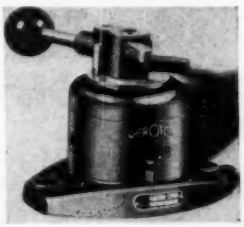
pinion, patented feather-edged rubber-sealed valves. Water rods can be replaced without removing power end covers. Complete pinion shaft assembly is reversible. Stub end rods are fitted with mud baffles. The one-piece crankshaft and forged-steel pinion shaft are mounted on Timken and American bearings. Power end features fully enclosed oil bath. *Wheland Co.*

IT'S NEW CHECK IT

(15) COR-IN ZINC PLUGS. Corrosion inhibitor zinc rods are fitted with standard pipe-plug ends, which screw easily into heat exchangers, piping, and other hydraulic equipment. Zinc rods come in ⅜, ½, ⅝, ¾ and 1-in. diameters, with lengths up to 12 in. Where corrosion may be aggravated by hot or salt water or other corrosive agents and catalysts, or by the electrolytic action of dissimilar metals, or stray currents, Cor-Ins have a basic application. *RotoMetals, Inc.*

IT'S NEW CHECK IT

(16) OIL PILOT VALVES. Known as the series 7000, they are used for remote control of oil-presure-operated four-way hydraulic valves. Operational control is gained by a fork-lever design, which, when actuated by a moving part of device being powered, permits the remote reversing of the main four-way valve. Both fork-lever and fork-and-hand-lever types (illustrated) are supplied. The latter permits manual interruption of the cylinder's forward or return stroke at any time. *Gerotor May Corp.*



TRADE LITERATURE

(17) CRANEMOBILE. Illustrations of on-the-job applications together with complete details of all models are included in this 12-page brochure. *Bay City Shovels, Inc.*

(18) HOW TO SOLVE CORROSION PROBLEMS. A six-page folder features two important charts that will help in selecting the right alloy for most corrosive conditions. A quick selector shows the comparative corrosion resistance of commonly used grades in 179 different corrosive media. *American Brake Shoe Co.*

(19) THE ECONOMIES OF HARDFACING. The eight-page illustrated reprint reviews advantages of hardfacing and offers an analysis of the problems leading to correct selection of proper hard facing rods. Design and cost figures are included. *Air Reduction Sales Co.*

(20) MAGNETIC MOTOR CONTROL. A 22-page bulletin announcing a new line of magnetic motor control presents complete product data including types of disconnects, reversing starters, nonreversing starters, reversing contactors, nonreversing contactors, and combination magnetic starters. *Trumbull Electric Manufacturing Co.*

(21) CARE AND OPERATION OF TOOL JOINTS AND DRILL COLLARS. The purpose of this 38-page, well-illustrated book is to provide the industry with a practical handbook that will be helpful in eliminating unnecessary tool joint troubles. Covers causes and preventatives for all common tool-joint failures. *Hughes Tool Co.*

(22) SOMETHING NEW HAS BEEN ADDED describes Model No. 30, dry chemical fire extinguisher. The six-page folder is amply illustrated and includes all physical and operating characteristics. *American-La France-Foamite Corp.*

(23) AERIAL SURVEYS AND MAPS FROM PHOTOGRAPHS describes and illustrates the equipment and technique employed by this company. *Abrams Aerial Survey Corp.*

(24) UP-RIGHT SCAFFOLDS, a six-page brochure illustrates erection, application, and portability of this aluminum alloy scaffolding. *Up-Right Scaffolds.*

(25) INSULATED PIPING SYSTEMS This 40-page book includes 37 pages of typical engineering drawing sections of insulated piping systems for many types of installations. *Ric-Wil Co.*

(26) ROPE DOPE is a four-page brochure dealing with factors of safety for wire ropes. Includes working diagrams for a variety of types of sheave alignment and types of reeving. *Union Wire Rope Corp.*

IT'S NEW ✓ CHECK IT

(27) AXIAL FLOW COMPRESSORS, an eight-page, well-illustrated brochure offers data on suction volume, rotor diameter, and speed as well as details on construction and operation of these compressors. *Clark Brothers Co., Inc.*

(28) KOEBELITE INSERT-TYPE CORE BITS is a folder describing the advantages of these diamond-core bits, and the process by which they are made. *Koebel Diamond Tool Co.*

(29) ROSKOTE. A 12-page book on corrosion-resistant coatings lists applications, describes characteristics of Roskote and the process by which it is produced, and explains its reaction on various surfaces. *Royston Laboratories, Inc.*

(30) SERVICE DIRECTORY. This four-page folder gives the address by states of all field service shops operated by this manufacturer of electric welders. *Lincoln Electric Co.*

(31) CORROSION PROTECTION OF STEAM AND CONDENSATE RETURN SYSTEMS. New four-page folder describes the recently developed Amine treatment which tends to inhibit corrosion of boiler and condensate systems. *Bird-Archer Co.*

(32) PROPERTIES AND CHARACTERISTICS OF 27 PER CENT CHROMIUM-IRON are comprehensively presented in a 30-page bulletin. It is illustrated with photographs, tables, and graphs. *Babcock & Wilcox Tube Co.*

(33) UNDERSTANDING THE AUTOMOTIVE DIESEL. A nontechnical treatise, this 67-page booklet is written in layman's language. Includes a brief history of the diesel engine and its contrasts with other forms of engines, diesel fuels, various combustion systems, two-stroke and four-stroke engines, fuel injection, engine control, diesel economy, and engine starting and stopping. *Mack Trucks, Inc.*

(34) NEW ROLLER-CHAIN CATALOG. A new, 12-page catalog containing information for all those connected with the use and specification of roller chain. Describes new features for safety, wear, and maintenance. *Atlas Chain & Manufacturing Co.*

(35) ARC WELDER SPECIFICATION CATALOGS. A new eight-page, two-color catalog containing illustrations, descriptions, dimensions, and specifications on its complete line of arc welders. *Hobart Brothers Co.*

(36) STUDIES IN CENTRALIZED LUBRICATION describes savings in labor of oiling, savings in lubricant consumption, elimination of downtime, and increase of machine production. *Farval Corp.*

(37) CARFONS, an eight-page brochure describing new 152-174 megacycle FM mobile communications equipment. The text is illustrated with 12 photographs, schematic diagrams, graphs, and line drawings. *Radio Corp. of America.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

There's an

H.C. SMITH ROCK BIT

For every formation in every field...

Faster, Straighter, Full Gauge Hole

TYPE K-2

TYPE DDT

TYPE K-2P

TYPE 6

TYPE E-2E

TYPE C-2C

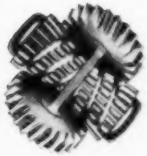
TYPE 2

TYPE 1-KH

TYPE 6-HH

TYPE 5-H

TYPE T-5


TYPE 4

H C Smith
OIL TOOL CO.

GENERAL OFFICES AND PLANT: P.O. 431, COMPTON, CALIF.

Pipeline
Know-how
• EFFICIENCY...
• EXPERIENCE..
• EQUIPMENT...
for any size job!
Smith
CONTRACTING CORP.
FORT WORTH • ODESSA
MAIN OFFICE: FORT WORTH NATIONAL BANK BUILDING
FORT WORTH, TEXAS

PIPE LINES

Coastal Plans Gas Line From Texas to Virginia

Coastal Pipe Line Co., Watts Building, Birmingham, is planning a 1,000-mile natural-gas pipe line from Texas to Norfolk, Va., which will have connections for serving Charlotte, N. C., Savannah and Atlanta.

Announcement of the filing of an application with the Federal Power Commission was made by Robert Lassiter, Jr., attorney, who recently resigned as counsel for the Charlotte Natural Gas Commission.

Already before FPC is the application of Piedmont Natural Gas Co. of Spartanburg, S. C., for a line along a route similar to that proposed by Coastal.

Gas Line Uses Board To Eliminate Padding

In the early stages of construction of the 268-mile, 26-in. Clendenin, W. Va.-Rockville, Md., line of Atlantic Seaboard Corp. and Virginia Gas Transmission Corp., methods have been tested recently for binding Midwestern's Capco cushion plate to the pipe, for a new application of this material, which is a hard, pliable, mastic board.

Applying mastic board for additional protection to avoid padding of line being laid for Atlantic Seaboard Corp. and Virginia Gas Transmission Corp. near Elkins, W. Va.

Sheets of this type of board are being bound around the pipe over coating and wrapping materials by men from the organization of Midwestern Engine & Equipment Co. seen in the photograph on this page. The work is being done in the mountains near Elkins, W. Va., at a point on the section of the project contracted by H. C. Price Co.

The purpose of the board is to eliminate the need for padding the ditch with soft dirt where ditching is done through rocky ground.

New Montana-Wyoming Gas Company is Organized

Montana-Wyoming Gas Pipe Line Co., a new company, is being organized with plans for public financing to provide for an $8,000,000 pipe-line construction project to bring natural gas from the Worland, Wyo., area, contracted with Pure Oil Co.

Gas from this source of supply is to be transmitted to markets now being served by Montana-Dakota Utilities Co. in eastern Montana, western North Dakota, and the Black Hills region of South Dakota. Operation is to commence not later than the fall of 1950.

Facilities of Montana-Dakota Gas Pipe Line Co. are to be leased by Montana-Utilities Co., Minneapolis, according to an announcement by R. M. Heskett, president of the latter company. Construction on the new line is expected to start in the fall of 1949. Applications are being prepared for filing with Federal Power Commission and the state public service commissions.

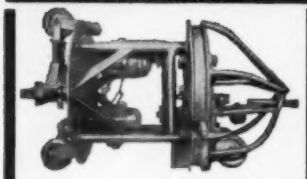
Blister Results From Improper Regulation

In the article by L. J. Cunningham, assistant superintendent, Northern Natural Gas Co., entitled "Spacing in Pipe-Line Welding," published on page 90, April 28 issue of The Oil and Gas Journal, it was pointed out that when a joint to be welded is set up with little or no spacing, often mistakenly done to speed up pipe-gang progress, the welding machine heat regulation is set so high that the

CRC
PIPE LINE CONSTRUCTION EQUIPMENT
CRUTCHER-ROLFS-CUMMINGS, INC.
Pipe Line Equipment and Materials
Houston - Tulsa

CLEVELANDS
. . . ARE MIGHTY EASY TO HANDLE ON THE JOBS . . .
because of their low center of gravity, exceptional balance, wide full-crawlers, all controls within instant reach of operator and complete visibility of work.
THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVE. - CLEVELAND 17, OHIO

CROSE
PIPE CUTTING AND BEVELING MACHINE



The electric model shown above is a rugged, heavy-duty clamp, electrically operated for the tough jobs.

ADVANTAGES:

For The Owners:
Better stringer bead; better finish weld; better pipe line.

For The Builder or Contractor:
Speed; stringer bead cut-out eliminated; economy; swabbing and alignment with one tool; less labor required.

Available for pipe sizes 12" through 36"
Rental or Outright Sale Basis

M. J. CROSE
MANUFACTURING COMPANY, INC.
MAIN OFFICE
2715 DAWSON RD. TULSA, OKLA.
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

CROSE
ELECTRIC MODEL
INTERNAL LINE-UP CLAMP

EQUIPPED WITH OUT-OF-ROUND ATTACHMENT

Machines to cut and bevel 16" pipe and over are furnished with out-of-round attachment. Machines to cut and bevel 14" pipe and under are furnished with standard torch holder.

M. J. CROSE
MANUFACTURING COMPANY, INC.
MAIN OFFICE
2715 DAWSON RD. TULSA, OKLA.
BRANCH OFFICE
M & M BUILDING HOUSTON, TEX.

welder has little control over the metal deposit.

Attention is directed here to correction of an error in the printed text. The remaining part of the author's correct statement is that this is done "with the result that the stringer bead is nothing more than a blister or an oxidized crust with just an occasional 100 per cent penetration."

Creole Pumps Through Ule-Amuay Pipe Line

Creole Petroleum Corp. is reported to be pumping crude oil at the rate of 300,000 bbl. daily through the 143-mile, 24-26-in. pipe line put into operation early this month.

The system is operating the Ule and Debajura stations.

Southern Natural, Atlantic Gulf's Hearing Postponed

Federal Power Commission has postponed until August 22 the hearing previously scheduled to start May 16 in Washington, D. C., in the consolidated proceeding involving applications of Southern Natural Gas Co. and Atlantic Gulf Gas Co. for authorization to construct natural-gas transmission facilities in the Southeast. Postponement was requested by the firms.

Southern Natural is seeking authorization to construct a 375-mile pipe line extending from Mississippi to Atlanta, Ga., with extensions to LeGrange and West Point, Ga., and Lanett, Shawmut, Langdale, Fairfax, and Riverview, Ala. The company's proposal also includes 225-mile trunk line from the Mississippi-Atlanta line to Colfax, Ga., with extensions to the areas of Tallahassee and Jacksonville, Fla.; Savannah, Ga.; and Georgetown, S. C.

Atlantic Gulf proposes to build a 1,530-mile line from Mississippi to the Georgetown and Jacksonville, Fla., areas.

Construction Started on Two Scurry County Outlets

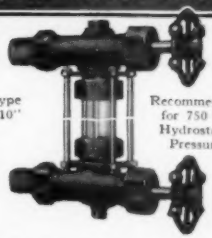
Construction has started on two new pipe lines to serve recently opened oil fields in Scurry County, Texas, which will be completed before the end of July.

Magnolia Pipe Line Co. is laying 25.6 miles of 8-in. line from Iatan Station in West Mitchell County, to a point in Section 158, Block 97, H.&T.C. Survey, north of the Sharon Ridge field in Southwest Scurry County.

From there, 11 miles of 6-in. line will be laid to a point in Section 295, Block 97, in the North Snyder-Canyon field, in North-Central Scurry County.

Gathering lines will be run out from both the 8-in. and the 6-in. sections of the line to all producing leases in

PENBERTHY
DROP FORGED STEEL
LIQUID LEVEL GAGES



Type "10"

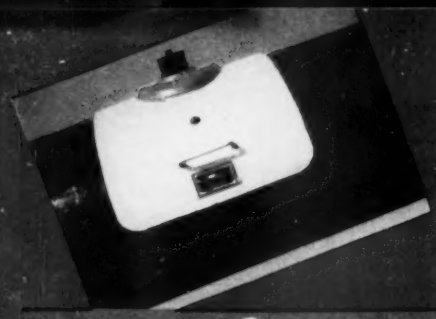
Recommended for 750 lb. Hydrostatic Pressure

Steel construction throughout with stainless steel interior trim. Automatic shut-off is positive and instantaneous; stainless steel balls shut off the flow of liquid when glass breaks. Heavy duty stuffing boxes, union connections, offset construction facilitate cleaning and simplify glass replacement. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

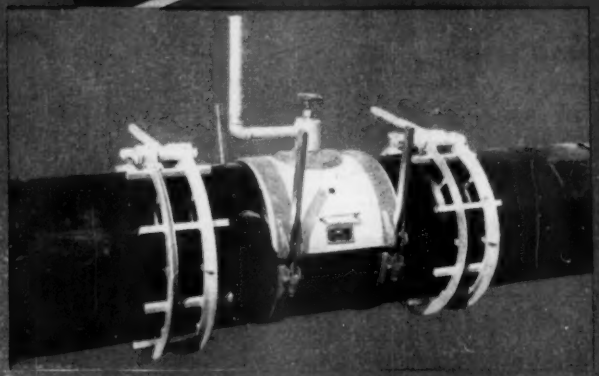
PENBERTHY INJECTOR CO.
DETROIT, MICH. WINDSOR, ONTARIO
Canadian Plant

RIVER
CLAMPS
LLOYD METAL FOUNDRY CO.
Carr and Opelousas Streets
Phone P 5325
HOUSTON TEXAS



Completed Installation of Tipton Pipe Line Patch

Jack Tipton, Inventor and Patentee



Installing Tipton Patch

FACTS ABOUT THE TIPTON ELECTRIC WELD HIGH PRESSURE PIPE LINE PATCH

The Tipton Patch has been perfected through many years of field testing and engineering. Electric welders have found this Patch to be completely safe for use in repairing leaks on modern high pressure pipe lines.

The specially designed gasket of the Tipton Patch seals off the pressure and the special venting plug permits venting away of gas, oil or other fluids while the Patch is being installed.

Clamps hold the gasket firmly in place while the welder puts on the stringer bead. The clamps are then removed and the welding completed. The vent plug is closed and vent line and jacket removed. Plug is sealed by welding.

For additional safety when installing Tipton Electric Weld High Pressure Pipe Line Patches, it is advisable to use a Tipton Line-Up Clamp on each side about 18 inches from the Patch.

AVOID SHUT-OUTS AND COSTLY DELAYS

The TIPTON ELECTRIC WELD HIGH PRESSURE PIPE LINE PATCH can be installed while line is in operation, thus avoiding shutting-out and draining line. On a large diameter high pressure gas pipe line this saves approximately five or six hundred thousand cubic feet of gas per mile, depending on operating pressure. Also, it saves the labor necessary to shut-out, drain, pack and return a line to service.

TIPTONS

ELECTRIC WELD HIGH PRESSURE PIPE LINE PATCHES AND LINEUP CLAMPS

WHEN A LEAK APPEARS HAVE A TIPTON PATCH NEAR

JTJ

Manufactured by The General Manufacturing Company, Okmulgee, Oklahoma

For Further Details Contact Manufacturer

"Everything for the Pipeliner"

PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

PIPE CLEANING and PRIMING MACHINES
Stationary and Line Traveling

American Steel Works
HEATING KETTLES

PIPE LINE SUPPLIES AND EQUIPMENT

PERRAULT Brothers INC.
1130 NORTH BOSTON
TULSA 6, OKLAHOMA
Phone 5-1104

418 MILES
By One Spread in One Year

One pipeline spread of Latex Construction Company laid and took up 418 miles of pipe during our fiscal year ending Nov. 30, 1948 . . . demonstrating the value of combining years of experience and specialization with a well integrated organization for more efficient pipeline construction.

The mileage of pipeline work done by this one spread was divided as follows:
Miles of Pipe laid, 16" and larger 306
Miles of Pipe laid, 8", 10" and 12" 62
Miles of Pipe taken-up and reconditioned . . 50

Latex CONSTRUCTION COMPANY
General Contractors
Oil-Gas-Gasoline-Water Pipelines
HOUSTON, TEXAS ATLANTA, GA.
L. H. Foxrat — G. A. Peterkin —
J. W. Sharman — E. P. Gregory

Scurry County, from which Magnolia is taking oil.

Pasotex Pipe Line Co., subsidiary of Standard Oil Co. of Texas, is laying 22 miles of 6-in. from the North Snyder field to a connection with the Basin Pipe Line System in Southeast Scurry County.

Pasotex has erected two 10,000-bbl. storage tanks in the North Snyder field, and is now laying a gathering system in that area.

United Lets Contract For Mobile, Ala., Line

United Gas Pipe Line Co. awarded contract to O. C. Whitaker Co. for the construction of a 90-mile, 20-in. line from the Baxterville, Miss., field to the Mobile, Ala., and Pensacola, Fla., areas and for a 9.5-mile gathering system in the Baxterville area. The company is substituting 20-in. for the 18-in. originally planned. Delivery of 20-in. is to begin June 30. Some preliminary work is under way.

Interstate Oil Honors 30-Year Service Employes

Recognition of 30-year service of five northern division employes was given by Loren F. Kahle, president, Interstate Oil Pipe Line Co. at a dinner in Tulsa May 20.

The 30-year employes honored are: Roy R. Creekmore, engineer-in-charge, Council Hill pump station; E. L. Semple, chief dispatcher, Tulsa; Clarence C. Duckworth, dispatcher; Leon A. McStravick, cashier; and Otis E. Ritter, gager.

Cuyama Valley Outlet Is Completed Within 14½ Days

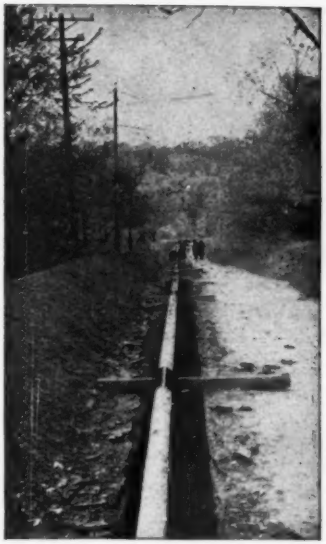
A 30-mile, 8-in. pipe line for Richfield Oil Corp., from the new Cuyama Valley field connecting with the San Joaquin-Maricopa pipe line, has been completed, after a construction period of only 14½ days. The line is Somastic coated.

Eleven miles of the pipe-line route was mountainous, requiring considerable barrowing. Pacific Pipeline & Engineers, Ltd., contracted the job.

The new 8-in. line replaces the temporary 6-in. line laid shortly after the Cuyama field was brought in. The temporary 6-in. line was originally part of the "invasion line" to supply Gen. Patton's armored force while it was in desert training.

United Line Is Completed

Construction of 6 miles of 10¾-in. pipe line from the Magnet-Withers and North Magnet-Withers oil fields in Wharton County, Texas, to the main United Gas Co. 18-in. Refugio-Houston line, has been completed.



NO OTHER PIPE JOINT PROTECTION LIKE TAPECOAT

It's easy to see why more and more distribution engineers are specifying TAPECOAT .. the modern pipe joint protection in tape form.

It's so quick and easy to apply . . . wraps around the welded pipe joint like tape around a baseball bat.

TAPECOAT is clean to handle, too. No dirt, no mess. It saves time, work, material and money while giving protection equivalent to the mill coating on the pipe.

That's why it will pay you to specify TAPECOAT for coating welded field joints, river crossings, pipe through building walls, service connections and on many other applications.

Write for bulletin, samples and prices

The TAPECOAT Company
1523 Lyons Street • Evanston, Illinois

New York Office
459 Fifth Ave., New York 17, N.Y.
Houston Office
Jas. E. Mayer Co., 514 M. and M. Building, Houston 2, Texas
Denver Office
1564 Valentia St., Denver 7, Colo

AN IMPORTANT ANNOUNCEMENT . . .

THE DOW CHEMICAL COMPANY

has transferred to its subsidiary

Dowell Incorporated

the marketing of its

MAGNESIUM ANODES

GALVO-PAK

GALVO-LINE

for control of underground corrosion

To serve industry better, Dowell Incorporated has been appointed by The Dow Chemical Company to market Dow-made magnesium anodes, Galvo-Pak and Galvo-Line. Dowell's widespread engineering organization and its continuing research program make it well qualified to help you put these materials to work controlling your corrosion problems.

Just 10 years ago, The Dow Chemical Company pioneered the development of magnesium anodes for corrosion control. Since that time, Dow cathodic protection materials have become widely recognized as an efficient, economical means of controlling corrosion of pipe lines, tanks, operating equipment, steel piling, cables and many other structures in contact with earth or water.

For full information on the use of magnesium anodes, Galvo-Pak, and Galvo-Line, *"Look to Dowell"*. Write directly to Tulsa for complete details.

DOWELL INCORPORATED • Tulsa 3, Oklahoma

SUBSIDIARY OF THE DOW CHEMICAL COMPANY

a PERCO* unit does all

The 10,000 B/D Perco catalytic unit recently placed in operation by a large refiner, is easily switched to any of these operations:

1. **GASOLINE DESULFURIZATION** — Boosts leaded octane of all the refinery straight run and cracked gasolines by 5 numbers with 99% volumetric yield.
2. **STRAIGHT RUN GASOLINE REFORMING** — Desulfurizes and reforms straight run gasoline to raise ASTM octane 8 points and Research octane 11 points with 97% yield.
3. **GASOLINE REFORMING — GAS OIL VISBREAKING** — Raises leaded octane of all straight run naphtha and a major portion of the cracked gasoline produced in the refinery while visbreaking 25° to 30° API gas oil to obtain 70% of No. 2 distillate of —20°F pour point and 30% of No. 5 distillate.
4. **GAS OIL CRACKING** — Catalytically cracks 25° to 30° API gas oil to yield high octane gasoline, No. 2 distillate of —20°F pour point and No. 5 fuel.

You can keep ahead in the octane race with a Koch engineered Perco unit. These low-cost units have been built in sizes ranging from 700 to 10,000 B/D. We'll be glad to give you our recommendations on a Perco unit to fit your requirements. Call or wire us—no obligation.

* Licensed by Phillips Petroleum Co.

THE KOCH ENGINEERING COMPANY, INC.

DESIGNERS • MANUFACTURERS • BUILDERS
335 WEST LEWIS STREET • WICHITA 2, KANSAS

REFINING

Deep Rock to Enlarge Its Cushing Refinery

DEEP ROCK OIL CORP., Tulsa, has inaugurated a modernization program which will completely revamp the company's Cushing, Okla., refinery, W. H. Garbade, president, announced this week.

A contract amounting to "several million" dollars, covering construction of a 5,000-bbl. fluid catalytic cracking plant, has been awarded to Jones & Laughlin Supply Co., Tulsa. Universal Oil Products Co., Chicago, designed the new unit, and advance engineering work is now under way. Actual clearing of the site and construction work will begin immediately, Garbade said.

Approximately 600 men will be employed on the project, and the plant will be completed and in operation during the spring of 1950.

A new crude battery, feed-preparation unit, heavy-oil vis-breaker, gas-recovery plant, and enlarged polymerization plant are involved in the expansion, together with such auxiliary equipment as enlarged boiler house, cooling towers, and water supply. A new research and development laboratory and a modern refinery office building also are to be built immediately.

The refinery was originally built in 1913 by Shaffer Oil & Refining Co., which was subsequently purchased by Deep Rock.

Sinclair Completes Work On Refinery Expansion

Sinclair Oil Corp. has completed its postwar program of expansion and modernization involving refinery additions and centralization, major additions to products pipe lines, modernization of marketing facilities, and a new research and development laboratory at Harvey, Ill.

This marks virtual completion of the company's entire expansion program, and capital expenditures of the company this year will be considerably below the $100,000,000 outlay of 1948.

Gasoline sales of the company the first 4 months of this year were up 8.17 per cent, but estimated consolidated earnings the first quarter of 1949 dropped to about $15,000,000 from $21,000,000 in the same period last year as a result, Spencer said, of decreased fuel-oil demand and the Mid-Continent allowable cutbacks. For the first quarter 1949, net crude production was down 1.5 per cent against a 16 per cent increase in 1948 over 1947.

Radioactive Tracers In Refining Research

Current uses of radioactive elements (isotopes) in refining research, and further suggested applications of these new tools, were discussed this week by Bruce S. Old, of Arthur D. Little, Inc., in a paper presented before the American Gas Association's production and chemical conference in New York.

Old cited Shell Oil Co., Inc., and Standard Oil Co. of California as among those oil companies employing radioactive hydrogen to study catalytic hydrogenation and dehydrogenation reactions. Other research divisions of oil companies are also employing carbon tracers to study catalytic cracking processes.

Use of Carbon 14, an isotope with a half life of 5,100 years, has revealed new information on the mechanics of the Fischer-Tropsch synthesis reaction, Old reported. The formation of liquid hydrocarbons and oxygenated-hydrocarbon mixtures from hydrogen and carbon monoxide was long believed to proceed through the intermediate formation of a metal carbide. This has been disproven by work at Mellon Institute.

Tracer technique should prove of value in the study of catalysts used in cracking petroleum fractions, he added. The nature of the carbon deposited on the catalyst during cracking, the kinetics of carbon deposition, and the nature of the carbon-burnoff reaction—all encountered in typical catalytic cracking operations—were declared possible fields for further tracer studies.

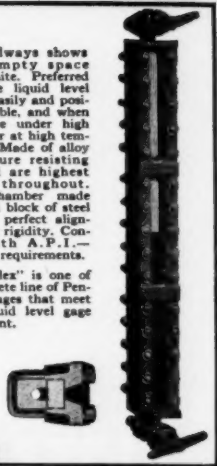
Old pointed to the possibility of improving processes for gas manufacture from heavy residual oils, and high-sulfur petroleum fractions evolving from tracer studies of catalyst composition, particularly of sulfur-active catalysts.

Another use of isotopes involves the measurement of quantities too minute to be detected by any other manner. In this application, measurements made with Geiger counters are in many cases a million million times more sensitive than the best possible microchemical methods, Old stated. This new methods has been adapted

PENBERTHY
"REFLEX"
DROP FORGED STEEL
LIQUID LEVEL GAGES

Liquid always shows black—empty space shows white. Preferred where the liquid level must be easily and positively visible, and when liquids are under high pressure or at high temperature. Made of alloy temperature resisting steel and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Reflex" is one of the complete line of Penberthy Gages that meet every liquid level gage requirement.



PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

SOUNDS OFF WHEN THERE'S TROUBLE!
SERIES 300
PANALARMS
THE UNIVERSAL SAFE MULTIPLE UNIT SIGNAL

LIGHTS UP TO SHOW WHERE!

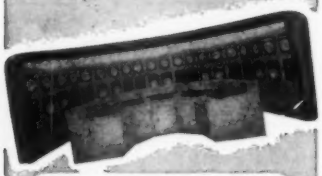
ADAPTED to
• Flush Mounting
• Wall Mounting
• Bracket Mounting
FOR MAXIMUM VISIBILITY

A new conception in Industrial Signal Systems—flexible, interchangeable units that convert speedily into ideal sound-and-visual alarms with a broad range of applications for Process Work, Power Plants, etc.

The same basic PANALARM unit makes possible Safety Shutdowns, Sequencing, or Interlocking of Plant Operations. Design is never frozen when you specify PANALARMS!

Write for illustrated catalog
PANALARM PRODUCTS, INC.
7216 N. Clark St., Chicago 26
A SUBSIDIARY OF PANELLIT, INC., MANUFACTURERS OF PREFABRICATED CONTROL SYSTEMS

FINE INSTRUMENTS *deserve* FINE PANELS



. . . like the admirable Falstrom CONTROL CENTER shown here! This is indeed the last word in modern instrumentation—suited to the finest and newest petroleum cracking plants or power installations.

. . . yes, nothing but an actual visit to this western control station can convey the sense of its sweeping beauty and painstaking construction.

. . . but we have tried to picture it for you in our Bulletin 126—write for it.

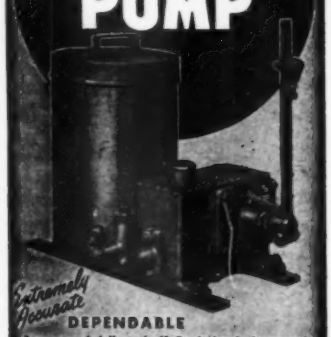
FALSTROM COMPANY

74 Falstrom Court, Passaic, New Jersey

ENGINEERS • DESIGNERS • FABRICATORS SINCE 1870

McCORD

TYPE "C" CHEMICAL MEASURING PUMP



Extremely Accurate

DEPENDABLE

Accuracy of delivery in McCord chemical pumps is the result of a finely engineered design with a minimum number of parts. Dependability is insured because working parts are fully enclosed, protected from dirt and the elements. Specify McCord. For sale by National Supply Co.

Standard of the Oil Fields

McCORD

CORPORATION, DETROIT 11, MICH.

to study bearing wear by California Research Corp.

To date, about 450 radioisotopes, induced by bombardment of elements in cyclotrons or neuclear reactors (atomic piles) are known. Old expressed surprise that the gas industry whose problems are readily adaptable to study by this new technique, was taking little advantage of so important a research tool.

Frontier Introduces "Scrubbed" Gasoline

CHEYENNE, Wyo.—Based on improvements recently completed at its refinery here, Frontier Refining Co. this month is introducing its new Unisol "scrubbed" gasoline in its Rocky Mountain marketing area. The refinery which has a crude-oil capacity of 11,000 bbl. daily has a 3,000-bbl.-daily fluid-type cracking operation and 2,600-bbl.-daily thermal cracking unit.

Harvey W. Blankenship, of Universal Oil Products Co., presented a paper at a meeting of Frontier jobbers and dealers explaining the new gasoline. The speaker said the gasoline undergoes 17 "scrubbings" to remove mercaptans. M. H. Robineau, president of the Frontier company, presided at the meeting.

New Vacuum-Distillation Unit to Operate in July

Initial operation of the new vacuum-distillation unit now under construction at the Hartford, Ill., refinery of Wood River Oil & Refining Co., Inc., is scheduled to begin in early July. Crude-oil capacity of the refinery, now rated at 27,500 bbl. daily, will be increased to a nominal 30,000 bbl. daily when the new vacuum unit is in production.

Also under construction at the Hartford plant is a 7,500-bbl. fluid-type catalytic cracking unit. The plant is equipped with a catalytic polymerization unit, rated at 350 bbl. daily. Completion of the catalytic cracking unit and its tie-in with other facilities at the refinery is scheduled for October 1. Koch Engineering Co. is handling the projects.

New Chemical Reportedly Stops Tools, Parts Rust

A new chemical for prevention of rust of tools, engine parts and fine instruments has been developed by Shell Development Co., the research affiliate of Shell Oil Co., Inc. The new product, called V.P.I. (vapor phase inhibitor), when used as a coating on ordinary kraft wrapping paper will neutralize the corrosive action of moisture in the air by the vaporization of the chemical inside the package.

CURTIN CENTRIFUGES

GIVE YOU QUICK, ACCURATE RESULTS WITH LESS EFFORT . . . AT LESS COST

Simple in design, ruggedly built for heavy duty service. Gear ratio and throw of crank produce required speed with no strain. Heads and cranks of 100 CC and 15 CC machines are interchangeable. Meets *A.S.T.M. Standard Method D-93 and A.P.I. Code No. 25 requirements.* Ask for full details.

W·H·CURTIN & CO. Inc.

DEPT. "C"

HOUSTON, TEXAS . . . NEW ORLEANS, LA.

INDUSTRIAL OIL AND GAS BURNING EQUIPMENT

NATIONAL AIROIL BURNER CO., INC.

1236 East Sedgley Avenue, Philadelphia 34, Pennsylvania

Texas Office: 2512 South Boulevard, Houston 6

"GUNITE" CONCRETE

(SINCE 1915)

LININGS FOR

BUBBLE TOWERS • SETTLERS • STILLS • SEPARATORS • TANKS • AND VESSELS OF ALL TYPES • ENCASING AND FIREPROOFING STRUCTURAL STEEL AND PIPE • LINING WATER RESERVOIRS, DITCHES, DRAINS, AND CANALS • REPAIRING DISINTEGRATED CONCRETE AND OTHER MASONRY.

See our catalog in Sweet's

GUNITE CONCRETE & CONST. CO.

1301 Woodswether Rd., Kansas City 6, Mo.

District Branch Offices

R. N. Turner, Dist. Mgr., 228 No. La Salle St., Chicago 1, Ill. B. H. Mueller, Dist. Mgr., 6625 Delmar Blvd., University City (St. Louis), Mo. Philip D. Barnard, Dist. Mgr., 2036 Addison, Houston 5, Tex.

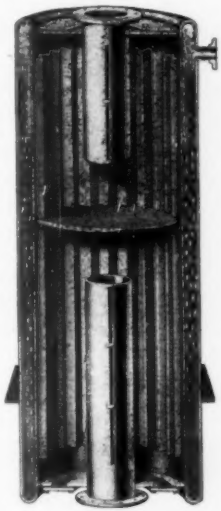
Branch Offices: Denver, Dallas, New Orleans

FREE

STEAM OR HOT WATER FROM YOUR PRESENT EXHAUST LINES

If you use steam or hot water for heating or processing, a Maxim Heat Recovery Silencer can produce it from the heat you normally waste out the exhaust pipe.

Maxim Heat Recovery Silencers act as exhaust silencers and are available with or without the spark arresting feature. They provide in addition an extremely efficient method of using exhaust heat to produce steam or hot water that you probably need anyway. It will pay you to investigate the whole story of this efficient way to stretch plant operating dollars.



BULLETIN ON REQUEST

THE MAXIM SILENCER CO.
98 Homestead Ave.
Hartford 1, Conn.

BE SURE IT'S A

MAXIM

BMX-60

When you need steel...

TRY US FIRST

WHEN you need steel, it's always a good idea to try us first. We are constantly increasing our facilities and expanding our organization in order to serve our customers more quickly and efficiently. For example, new warehouse buildings, scientifically laid out to speed zoning and loading, have been erected in a number of our districts. In several other important marketing areas we have opened new warehouses. And all our plants are being equipped with the latest machinery for cutting, processing and handling materials.

This progressive planning has but one object in view—giving you the very best in steel warehouse service.

As rapidly as possible, we are increasing our stocks. If you will check with us, you will find that many grades and types of steel are now available for prompt delivery.

So, try us first—for steel—for metal-working tools, supplies and machinery. Simply telephone, wire or write the warehouse or sales office nearest you.

Your inquiries for literature covering Stainless, Alloy and High Strength Steels will be given prompt attention. You're under no obligation.

SYMBOL OF SERVICE FOR STEEL USERS

UNITED STATES STEEL SUPPLY COMPANY · USS STEELS · SERVICE

United States Steel Supply Company
Dept. FF-5-26, 208 S. La Salle St., Chicago 4, Ill.
Without obligation on our part, please send us FREE booklets on U-S-S Stainless Steel as checked below:

☐ Stainless ☐ Alloy ☐ High Strength

Name..... Title.....
Firm Name.....
Address.....
City..... Zone..... State.....

UNITED STATES STEEL SUPPLY COMPANY

Warehouses: BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES
MILWAUKEE · MOLINE, ILL. · NEWARK · PITTSBURGH · PORTLAND, ORE
SAN FRANCISCO SEATTLE · ST. LOUIS · TWIN CITY (ST. PAUL
Also Sales Offices at: KANSAS CITY · PHILADELPHIA · TOLEDO
TULSA · YOUNGSTOWN
Headquarters Offices at: 208 S. La Salle St.—Chicago 4, Ill.

USS

UNITED STATES STEEL

NATURAL GAS

Work to Start Soon on Magnolia Cycling Plant

CONSTRUCTION will start within a month at Magnolia Petroleum Co.'s new pressure maintenance and cycling plant for the deep Chitwood pool of Grady County, Oklahoma, R. D. Hanley, vice president of the company, announced in Dallas last week.

The firm has awarded contract to the Construction Service Co., Houston, which is starting temporary construction this week. Engine-compressor units, ordered in 1948, have been delivered at the plant site, and completion of the project is expected sometime in December of this year.

The plant will be on the Drummond lease in the southwest quarter of Section 34-5n-6w, near the center of the Chitwood field, which is located 7 miles southwest of Alex, Okla. The Rock Island Railroad has constructed a double-track spur near Agawam, which will handle incoming equipment and later will be used for a products-loading rack.

Magnolia's plant will have four 880-hp. compressor units, capable of handling 37,750,000 cu. ft. of natural gas per day. After processing the field gas, the residue will be returned to the three producing sand zones in the field.

Magnolia discovered Chitwood pool in May 1945 at 1 Cunningham, and since that time has added 14 more producers to prove three zones: the Cunnningham, Boatwright, and Spiers. The three zones have been unitized separately under Oklahoma Corporation Commission orders, each zone covering approximately 1,500 acres.

Third Panhandle-Region Carbon-Black Plant Closed

Higher cost of natural gas, and cuts in the cost of carbon black have been responsible for the shutting down of three carbon-black plants in the Texas-Oklahoma panhandle area by Cabot Carbon Co. Officials said that due to cost factors operation of the plants was unprofitable.

Latest closing is the company's Armstrong channel-black plant at Stinnett, Tex. Other plants closed in recent weeks include General Atlas Dixon plant, and Nash channel-black plant, both at Guymon, Okla.

The Stinnett plant has employed 25 persons, most of whom will be absorbed into other Cabot operations in the Panhandle. The General Atlas Dixon plant at Guymon has been dismantled, and equipment moved to a Cabot plant at Hobbs, N. M. The remaining Guymon plant will not be moved.

Gas-Technology Course Will Start at Kingsville May 30

The fourth annual short course in gas technology, offered by Texas College of Arts and Industries, Kingsville, and sponsored by Southern Gas Association, will be held at Kingsville May 30 through June 1.

A number of papers will be delivered on engineering studies, centrifugal compressors, gas conservation, and reservoir problems.

D. T. MacRoberts, United Gas Pipe Line Co., Shreveport, will serve as chairman, and R. H. Ulrich, Southern Natural Gas Co., Birmingham, will serve as vice chairman.

R. H. Hargrove, Shreveport, president of Texas Eastern Transmission Corp., will address the morning assembly May 30, and Richard M. Kleberg of Kingsville, chairman of the board of directors of the King Ranch, will speak at the banquet that night.

The course is being presented by Texas A. & M. College for the fourth consecutive year. Dr. Frank H. Dotterweich, administrative committee chairman, is engineering division director at A. & M.

Erie Gas Service Co. Seeks Permission to Build Line

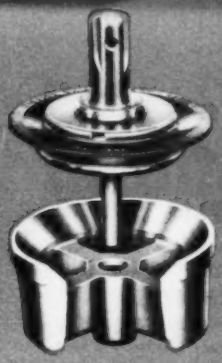
Federal Power Commission has been asked to authorize construction of 72 miles of pipe line in northern Ohio for transportation of 26,000,000 cu. ft. of natural gas daily for resale to utility companies serving the area east of Cleveland, including communities of Wickliffe, Willoughby, Grand River, Fairport, Painesville, Geneva, and Ashtabula.

The appplication was filed by Eugene H. Cole of Washington, D. C., who plans to incorporate and operate the Erie Gas Service Co., Inc.

Gas requirements of the line would be supplied by Tennessee Gas Transmission Co., the application states, through a connection with the latter company's proposed Kentucky-Buffalo line in the vicinity of Meadville, Pa. FPC hearings involving Tennessee's proposed Kentucky-Buffalo line are currently in progress in Washington.

The proposed Ohio project, to be built at an estimated cost of $1,550,000, would be financed through private sale of securities, the application says.

Transmission committee luncheon at recent spring meeting of Natural-Gas Department, American Gas Association, French Lick, Ind. Front row: C. S. Coates, Tennessee Gas Transmission Co., Houston; D. C. Palm (leaning forward), Natural Gas Pipeline Co. of America, Chicago; E. A. Koenig, Texas Eastern Gas Transmission Corp., Houston. Back row: Benjamin Miller, New York City; George H. Smith, assistant managing director of A.G.A., New York City; D. A. Hulcy, Lone Star Gas Co., Dallas, chairman of Natural-Gas Department and second vice president of A.G.A.; F. A. Hough, Southern Counties Gas Co., Los Angeles, chairman of Transmission Committee; P. E. Beckman, Pacific Gas & Electric Co., San Francisco; Grove Lawrence, Southern California Gas Co., Los Angeles; Joseph T. Innis, Northern Natural Gas Co., Omaha; G. F. Brunston, Colorado Interstate Gas Co., Colorado Springs, Colo. The committee discussed plans for enlarging to handle activities in the coming year



The New MISSION "Super-Service" Valve for extremely high pressures

This Famous Insert Gives

3 to 10 TIMES THE SERVICE!

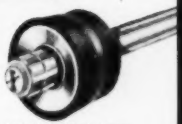
MISSION'S policy of developing only products of *exceptional* merit is nowhere more strikingly illustrated than in our "Compound 308"* valve insert. Thousands of actual performance records have *proved conclusively* that this remarkable insert lasts 3 to 5 times as long as regular inserts in ordinary mud, and up to 10 times as long as ordinary oil-resisting inserts in hot, chemically treated, or oil base muds.

By installing a new MISSION Replaceable Seat Bushing each time a new "Compound 308" Insert is installed . . . the parts of the valve which receive appreciable wear are completely renewed, and you *multiply* the days of *trouble-free* operation.

Mission Manufacturing Co., Houston 14, Texas

Export Office: 30 Rockefeller Plaza, New York 20, N. Y.
European Address: London, England.

*TRADE MARK REG. U. S. PAT. OFF.



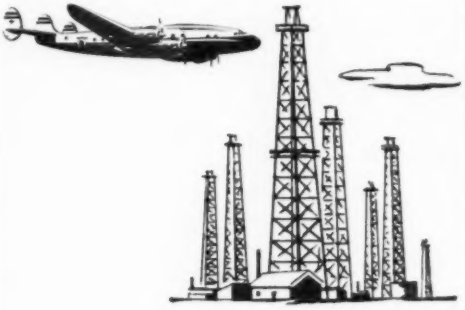
MISSION Slush Pump Piston and Super-faced Rod

MISSION Self-Sealing Gland Packing

MISSION SLUSH PUMP PARTS

. . . have a *mission* . . . to save you money!

G-138



Fly KLM to these great

Caribbean Oil Centers

... Daily Constellation Service
from MIAMI to
ARUBA – CURACAO
CARACAS – MARACAIBO

2 flights weekly to
BARCELONA (PUERTO CRUZ)

The Royal Route of course! And if you have flown KLM you know this means . . . *extra* courtesies, conveniences and services! Now, Constellations give you five mile a minute speed . . . luxurious comfort. Business or pleasure . . . when you fly the Caribbean . . . fly KLM.

AIR CARGO SPACE AVAILABLE ON ALL FLIGHTS

K·L·M
ROYAL DUTCH AIRLINES
1919 30TH YEAR 1949

THE WORLD'S FIRST AIRLINE
TO ACHIEVE ITS 30TH ANNIVERSARY

FOR INFORMATION SEE YOUR TRAVEL AGENT OR FREIGHT BROKER or KLM Royal Dutch Airlines, 572 Fifth Ave., New York, N. Y. LU 2-4000; 308 N.E. 1st Street, Miami 3-8455. Other KLM offices in Los Angeles, San Francisco, Chicago, Washington, Boston and Montreal.

WEB WILSON
Tiger Tooth TONG DIES
A POSITIVE "BITING" GRIP ON THE HARDEST TOOL JOINTS
Web Wilson "Tiger Tooth" Tong Dies are especially recommended for flame hardened and hard metal surfaced tool joints or wear subs. Specify WEB WILSON "TIGER TOOTH" TONG DIES.
WEB WILSON
Oil Tools
It's a Wilson!
W. W. WILSON BLDG.
HUNTINGTON PARK
CALIFORNIA

GUARD YOUR ENGINE'S HEART ZONE

LUBRICATE
THE HEAT ZONE

Your engine's heart zone is its heat zone—the top cylinder area. That's where vital valves must work—where heat is hottest—where sizzling temperatures scorch lubricants and leave bare metal unprotected . . . that's where Marvel Mystery Oil and the Marvel Inverse Oiler really go to work!

Marvel Mystery Oil is specifically compounded to resist heat. Here's liquid armor for your engine's heart—this *extra* tough protective film cleans as it clads! Marvel dissolves sticky gum, sludge and varnish from valves, guides and rings—keeps them cleanly coated.

Your engine throbs with power when lubrication is right. Performance picks up, and "down time" stays down. Ask for the facts. Emerol Mfg. Co., Inc., 232 W. 69th St., New York 23, N. Y.

use the
MARVEL
INVERSE OILER WITH MARVEL MYSTERY OIL

The Marvel Inverse Oiler, easily installed, proportions the flow of Marvel Mystery Oil precisely to the needs of your engine.

Among the

Drilling Contractors

Westsmith Joins Staff Of Drilling Association

American Association of Oilwell Drilling Contractors, Dallas, has announced the appointment of Jack N. Westsmith, formerly editor and general manager of Petroleum World, Los Angeles, as director of public relations and membership work. Westsmith is a graduate (1928) of Stanford University, majoring in mechanical engineering.

Parker Operates 11 Rigs In Western Canada Play

Parker Drilling Co., Tulsa, has moved an additional rig into Alberta Province, Canada, making a total of 11 rigs the company now is operating in that area. The company's first rig in Canada was moved in about 2 years ago to drill the discovery well of the Pincher Creek field for Canadian Gulf Oil Co. The latest rig is drilling for the same company in the Redwater area, northeast of Edmonton.

Currently, 2 of the 11 rigs are working for Canadian Gulf Oil Co. in the Pincher Creek area; 2 are on wildcats for the same company in the Stettler area, 100 miles northeast of Calgary; 3 are in the Leduc-Woodbend field for Imperial Oil, Ltd., and 4 in the Redwater area, including the 1 for Canadian Gulf, 2 for Imperial, and 1 for British American Oil Co. and Hudson's Bay Oil & Gas Co.

Canadian headquarters recently have been set up in the Royal Bank building at Calgary with C. A. Nabors as resident manager. Paul Taylor is drilling superintendent with headquarters at Edmonton.

Heathman-Honaker Drilling Co., Wichita, is starting a joint semiwildcat test with Sunray Oil Corp. on the Richardson tract in 17-10-19, ¾ mile east of the North Berland pool, Rooks County, Kansas. The rig now on another wildcat being drilled by the same operators 1½ miles northeast of the Berland pool will be used.

Gracey Drilling Co., Houston, will drill a 12,000-ft. wildcat test for Union Oil Co. of California on the latter's state lease No. 1,700, 2 miles south of production of the Tigre Lagoon field, Iberia Parish, coastal Louisiana.

Cox & Clark Drilling Co. has contract from Union Sulphur Co., Inc., to drill a Wilcox zone test in the Watkins Ranch field area, northeastern Webb County, South Texas. Contract is for 6,500 ft.

H. E. R. Drilling Co. has sold a half interest in its 960-acre block in the Dove Creek area, Montezuma County, Colorado, to Martex Realization Corp. and General American Oil Co. Included in the deal is a half interest in a 5,000-ft. test now drilling and in an additional test to be drilled near production recently opened by Byrd-Frost.

T. G. & M. Drilling Co., Corpus Christi, has contract for an 8,500-ft. wildcat test to be drilled for Graham-Spencer in the John Smith survey, Aransas County, Texas Gulf Coast.

Makin Drilling Co., Hobbs, N. M., is setting up a new Wilson rig for a deep test to be drilled for N. G. Penrose, Inc., in the Eunice field, Lea County, New Mexico. This company has two other rigs in the field, one completing a deep test for Tide Water Associated Oil Co., and the other for Continental Oil Co. It also has a rig running for Skelly Oil Co. in the Monument field in the same county.

Watts Drilling Co., Arp, Tex., has contract for a 6,500-ft. well to be drilled for W. L. Pickers, Dallas, on the Black estate tract in the D. M. Friesman survey, 4 miles east of Jewett, Leon County, East Texas.

ROTARY RIGS IN OPERATION*

(United States and Western Canada)

Area—	Week ended 5-16-49	Change week ended 5-9-49	Change week ended 5-17-48
Gulf Coast	541	— 5	—15
W. Tex.-N. M.	551	— 7	—24
Ark.-N. La.-E. Tex.	151	+ 2	— 7
Oklahoma	262	— 1	—19
Kansas	120	— 1	—27
Illinois-Eastern	117	—10	+ 4
Rocky Mountains	110	— 2	—39
Pacific Coast	196	— 2	+23
Total U. S.	2,048	—26	—104
Western Canada	80	+ 3	+41
Total	2,128	—23	—63

*Courtesy Hughes Tool Co.

PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

USE 'BESTOLIFE
IT'S BETTER

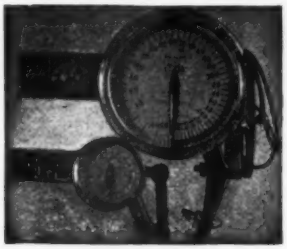
'BESTOLIFE—the Lead Seal Joint Compound used successfully in the Drilling and Refining Industries for years — is immediately available through more than 100 distributors in the U.S.A.

Your nearest supply house field store probably has 'BESTOLIFE in stock for immediate delivery. Use 'BESTOLIFE — It's BETTER!

EXPORT: THE NATIONAL SUPPLY CORP., 30 ROCKEFELLER PLAZA, NEW YORK

I. H. GRANCELL
1801 BABY MADEAU STREET
LOS ANGELES 1, CALIFORNIA

LINE SCALES



(Above) Super 500,000-lb. capacity, 14" dial. (Below) Packer Special, Capacity 40,000 lbs., 6" dial. 18 other models for every drilling, well servicing, or work-over need.

20 MODELS to choose from

With a LINE SCALE you know the pull on the line, and the weight on the bit in pounds. Repeated tests prove the accuracy and dependability of LINE SCALE readings under all working conditions . . . even in areas of rapid temperature changes.

LINE SCALE CO., Inc.

Box 4245 **Oklahoma City** Ph. 6-1765

Gulf Coast Representative: Hiram Wheeler Box 8043, Houston 4, Texas — J2-1107

NOW 3 FINE

Jimmie Gray COMPOUNDS

INSURE **LONGER LIFE FOR TOOL JOINT THREADS**

EXCLUSIVE 500 TON SPECIAL

You can always break the joint when you use Jimmie Gray Compounds! Each one is engineered to do certain specified jobs best!

KANT-GALL TOOL JOINT COMPOUND

Both new compounds have the same dependable quality, the same money-back guarantee as the widely used Jimmie Gray 500 TON Special!

LONG LIFE DRILL COLLAR COMPOUND

SOLD BY SUPPLY STORES EVERYWHERE

PETROLEUM DISTRIBUTING COMPANY

Formerly STANDARD OIL SALES CO.

BOX 203 HOUSTON, TEXAS

CHARTER 4-5648

Standard-Fryer Drilling Co. Dallas

Although a relative newcomer to the contract drilling business, Standard-Fryer Drilling Co. has a record of highly successful operation. Both of its two principal owners, R. J. Fryer, president, and R. C. Hanson, vice president and general manager, have had many years of oil field experience. The former's oil field work started in Oklahoma in 1920. In addition to its Dallas offices in the M & W Tower building, the company has field operating headquarters at Chico, Wise County, Texas.

Key personnel. — In addition to Fryer and Hanson as president and vice president-general manager, respectively, Fryer's son, Jack, is secretary-treasurer, and Everett R. Jones, Jr., comptroller. The latter only recently joined the company. Previously, he was associated with the Lafitte Oil Co., Louisville, Ky. Toolpushers are Don Harris, S. E. Simmons, O. M. Mahaney, U. S. King, and J. J. Jourdan.

Operations.—Operations have been located largely in North, West Central and West Texas. Currently, the company has seven rigs running. Three of these are in Wise County, two working for Cities Service Oil Co. in the Chico area, and the other for Signal Oil Co. on a wildcat in the southern part of the county. Three are drilling for Lone Star Producing Co., one in the Cisco area, Eastland County, and two in Scurry County. One of the latter jobs is a joint operation. The seventh rig is drilling for Pure Oil Co. in Young County.

General.—Working for Cities Service Oil Co., the company drilled the discovery well of the Chico field, opened in 1947. Since then, it has drilled a number of extensions as well as development wells in that field.

Crowe Drilling Co., Wichita, has staked location for a second test to be drilled for its own account in the wildcat area 4 miles northwest of the Laton pool, Rooks County, Kansas. Location is in the NE NE NW 18-8-16. First test, drilled a year ago, was dry.

Bateman Drilling Co., New Orleans, has contract for a 1,200-ft. semiwildcat test to be drilled for Martex Realization Corp. and General American Oil Co. on the east flank of the New Iberia salt dome in Iberia Parish, Louisiana Gulf Coast.

Protect Your Cores

Extrulite

PLASTIC CORE TUBES

- New way to preserve cores for filing and transportation. Non-breakable, tamper-proof, easy to use and reuse. Air-tight water-proof seal. More than pays for itself by savings in transportation weight.
- Available in 3′ lengths in diameters to handle most cores. Carrying cases are available.
- *Mid-Continent and Rocky Mountain distribution by the Reed Roller Bit Co.*
- Send for sample and details. For Export and California sales, write factory.

Extruders INC.

8509 HIGUERA STREET, CULVER CITY, CALIF.

Standco

NO-SMOKE

STANDCO BRAKE LINING

Nothing novel—no bunk, but it gets the job done without scoring brake rims. See pages 3608-3613, Composite Catalog.

Standco Brake Lining Co.

HOUSTON

MORE THAN 400 FORMS FOR THE OIL INDUSTRY CARRIED IN STOCK

save on forms

FAST SERVICE

WRITE FOR FREE CATALOG OF kraftbilt STANDARD FORMS

ross-martin co.

419 E. 4TH TULSA 1, OKLA.

AGAIN AND AGAIN

the choice of oilfield men!

AMERICAN IRON & MACHINE WORKS CO.
MANUFACTURERS OF OILFIELD EQUIPMENT
A
REG. U.S. PAT. OFF.
OKLAHOMA CITY U.S.A.

WHEREVER OIL IS PRODUCED
the men who know best, use our
Products for Perfect Performance!

- Slush Pump Valves and Seats
- Valve Seat Pullers
- Straight Grip Tool Joints
- Tubing Tool Joints
- Slush Pump Release Valves
- Slush Pump Suction Hoists
- Slush Pump Compounding Valves
- Standpipe & Manifold Fittings
- Simplo Friction Catheads
- Simplomatic Catheads
- Automatic Catheads
- Releasing & Circulating Overshots
- Overshot Accessories
- Rotary Milling Tools
- Rotary Releasing & Circulating Spear
- Straight Rotary Taper Taps
- Rotary Die Collars
- Steel Tool Boxes
- Steel Tool Houses
- Bug Blowers
- Casing Wagons
- Packer Circulation Joints
- Packers
- Packer Cup Assemblies
- Drill Collars
- Drill Collar Lifting Subs
- Rotary Substitutes
- "Hour Glass" Rotary Sub
- Square & Hex Kellys
- Pumping Well Christmas Trees
- Sucker Rod Coupling and Paraffin Scraper
- Paraffin Bit

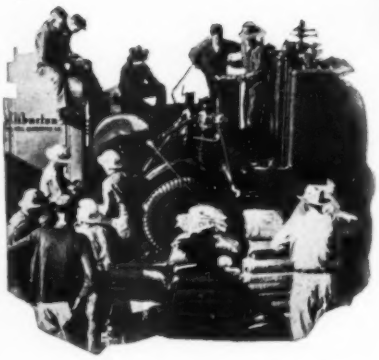
"Amweld" (counterbore weld) Tool Joints

AMERICAN IRON & MACHINE WORKS CO.
Oklahoma City, Oklahoma • Box 1177 • Phone L.D. 518
District Office, Houston, Texas
Export Office: 420 Lexington Ave., New York City, N. Y.

Over 26 years of designing, engineering and manufacturing experience

For best results in oil-well cementing...

Drillers get better results and gain precious time by using Unaflo* oil-well cement. For routine or hazardous work in cementing casing, re-cementing, plug-back operations and squeeze cementing, Unaflo protects your investment in tools and equipment. Because...



UNAFLO pumps easily ...sets hard

It has the delayed, the postponed, the *retarded* set. It remains fluid and pumpable throughout the cementing operation, under different hole temperatures and pressures. Then, after the period of retardation, it hardens normally to form a strong, dense, impermeable seal.

THIS BULLETIN GIVES YOU THE STORY

Here, in handy reference form, you'll find the advantages of Unaflo explained. Practical case histories of actual oil-well application back up the technical information. And easy-to-follow diagrams illustrate the sections dealing with various cementing operations . . . *To get your copy of "UNAFLO Oil-Well Cement," write today to Universal Atlas Cement Company, Chrysler Building, New York 17, N. Y.*

*"*UNAFLO" is the registered trade mark of the retarded oil-well cement manufactured by Universal Atlas Cement Company*

WACO • KANSAS CITY • BIRMINGHAM • CHICAGO • NEW YORK

Export Distributor: United States Steel Export Co., New York

OG-U-104

UNIVERSAL ATLAS CEMENT COMPANY

OIL-FIELD CEMENTS

Unaflo *Retarded* Oil-Well Cement
Resistant to Sulfate Waters
Atlas Portland Cement—Type I

Atlas Portland Cement—Type II
Resistant to Sulfate Waters
Atlas High-Early Cement—Type III

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—ABC Network*

Rocky Mountain Exploration Notes

RUMORS of oil shows in a North Dakota wildcat are attracting wide attention among Rocky Mountain exploration men, because of the big land play that has been going on in the Williston basin in that state. The well is Price Drilling Co. 1 Kline, SE SE SE 16-157n-85w, Minot area of Ward County, North Dakota. The well was started last August, slated as a 7,500-ft. test of the Devonian.

Current reports are that while drilling in the Madison (Mississippian) lime, streaks of oil saturation have been found in three different zones. Latest reports were that drilling was at 6,135 ft., still in Madison, which had been topped at 5,640 ft. Other tops reported were: Pierre 1,000 ft., Niobrara 2,325 ft., Benton 2,515 ft., Dakota 3,412 ft., Lakota 3,580 ft., Morrison 3,770 ft., Ellis 3,920 ft. (?), Spearfish 4,675 ft., Minnekahta 5,155 ft., Kibbey 5,410 ft., and Madison 5,640 ft. Those interested in comparing these data on other wells drilled in general area will find North Dakota Geological Survey Bulletins 12, 18, and 21 of service. If these are not handy, Bulletin 18 is a reprint of article in National Oil Scouts and Landmen's Association Yearbook, Vol. 14, pages 420-430, 1944.

The Williston basin has been the scene of a terrific land play in recent months, with estimates of the amount of leases taken ranging upwards of 5 million acres, and activity still pretty strong. In part this play reflects the results of the exploration in the Alberta syncline in Canada, with its tremendous Devonian reef strikes. (See pages 76-79, Possible Future Oil Provinces of the United States and Canada, published by The American Association of Petroleum Geologists.)

Rocky Mountain exploration men are also displaying great interest in a new logging method that is a big help in the light, low-permeability oil-producing formations that are common in the Paleozoic section in this region. The new method is called micrologging, or microresistivity. It is an electrical method, with the electrodes spaced about 1 in. apart, and is run in contact with the walls of the hole on a device very similar to a caliper logging mechanism.

What seems to happen is about as follows. If there is any permeability in the formation, there is a mud cake on the walls of the hole and the resistivity is very low. If the formation is dense and permeability is lacking, no mud cake is present and the resistivity of the formation, which is high, is recorded. In shale formations, while the resistivity reading is low, the formation can easily be identified by other criteria from the conventional electric logs. Soft sandstones and soft or porous streaks in limestone, or cracks and fissures in an otherwise dense limestone, being filled with mud, show up as sharp breaks of low resistivity. Breaks as small as 2 ft. thick show up quite clearly.

The method is now established on a commercial basis in Wyoming, and is about ready for introduction in Montana. Experimental tests are understood to have achieved success in Kansas. The logs are interpreted for the operator by marking symbols opposite various intervals. The symbols rate the section for probable hydrocarbon content as "good," "fair," "questionable," or "no hydrocarbons." *For further details, write Reader Service Department, The Oil and Gas Journal.*

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN AREA.—Seven-inch casing was cemented at 19,765 ft. at Superior Oil Co.'s 1 Unit, world depth record well at Pacific Creek, Sublette County, Wyoming, and the operator is now preparing to drill deeper. Amerada Petroleum Corp. recovered some oil on extended tests in the Sundance at the 1 Unit, Sage Spring Creek wildcat, Natrona County, Wyoming.

SOUTH LOUISIANA.—An important oil strike in the East Longville area of Beauregard Parish has been indicated by Barnsdall Oil Co. 1 M. Jones, 3-6s-9w, 3 miles east of Longville oil production. A net sand body of 35-40 ft. of saturated section was penetrated, with top of oil pay at 8,306 ft. Through perforations at 8,320-8,336 ft., using 12/64-in. choke, the well flowed at the rate of 392 bbl. per day.

SOUTHWEST TEXAS.—A link well between La Gloria field and Blucher field in Jim Wells County, La Gloria Corp. 4 Arthur A. Seeligson, is being completed as a gas-condensate producer. Perforations from 7,028-30 ft., 7,022-30 ft., and 7,005-17 ft. tested gas-condensate. Well is completing through 5/16-in. choke, with 2,025 psi. tubing pressure. No potential gage has been reported. Total depth is 8,184 ft.

WEST TEXAS.—Stanolind Oil & Gas Co.'s 15 American Warehouse Co., Ellenburger failure in Cedar Lake field of Gaines County, recovered water blanket and 3,900 ft. of sulfur water, cut with gas and a rainbow show of oil, on its first drill-stem test of the Devonian after plugging back. The 4-hour test, from 12,295-354 ft., covered a section which yielded clean oil on a previous test.

NORTH TEXAS.—C. J. Simpson's 1 Lydia Chipman, R. Barr Survey, 3 miles east of Cundiff in Jack County, scheduled Ellenburger test, may present a clearer picture of the large Bend conglomerate area which has been shaping up from Chico field of Wise County into northeastern Jack County. Location is about 2½ miles north of Grace Ranch conglomerate discovery and 3½ miles northwest of Glasscock & Pontiac 1 Morris, which extended the conglomerate pay 2 miles west of Chico field.

MISSISSIPPI

Completion Opens Sixth Field in Adams County

JACKSON — The sixth field in Adams County is being opened by Sohio Petroleum Co., Hunter Jones, and Kemp Drilling Co. 1 George Armstrong, 36-5n-3w. Operators cored 7 ft. of saturated sand in the Wilcox, 6,469-6,476 ft. Top of sand was encountered in core from 6,465-70 ft., in which recovery was 4 ft. of shale and 1 ft. of saturated sand. A 5-minute drill-stem test from 6,470-72 ft., using $\frac{5}{8}$-in. and $\frac{1}{4}$-in. chokes, pressure built up to 28 psi. and was steadily increasing when tool was closed. Oil started kicking out of drill pipe when there was 2,500 ft. of pipe remaining in hole, estimated to be 2,250 ft. of 37°-gravity oil, with no water. Bottom-hole flowing pressure was 1,700 psi. and shut-in bottom-hole pressure was 2,700 psi. Coring was resumed after hole was conditioned and at a total depth of 6,521 ft. the 7-in. casing was cemented on bottom. Operators now are waiting on cement to set.

In Jones County, Walter E. Sistrunk 1 H. C. Powell, 18-8n-13w, has been abandoned as a dry hole at total depth of 2,608 ft. in Cap Rock. Top of Cap Rock was picked at 2,032 ft. Three sidewall cores were taken with recovery being sand with no show. This is the 41st piercement salt dome discovered in Mississippi, and has been named "Centerville" by the Nomenclature Committee of the Mississippi Geological Society.

Midstates Oil Corp. 1 Geo. Bacon, 51-6n-2w, in LaGrange field, South, Adams County, has been completed flowing 209 bbl. of 46°-gravity oil through a 10/64-in. choke. Production is through perforations at 6,297-6,303 ft. Total depth is 6,303 ft.

In Mallalieu field, Lincoln County, The California Co.-Sun Oil Co. 1 Wilson-Jordan, Unit 1, 13-6n-7e, was completed through perforations at 10,460-80 ft., for an initial production of 130 bbl. of 38.1°-gravity oil flowing through a $\frac{1}{2}$-in. choke. Total depth 10,482 ft.

Also in Mallalieu field, Gulf Refining Co. T. Brady, Jr., et al Unit 1, 19-6n-8e, completed through perforations at 10,404-22 ft., flowing 195 bbl. of 38.2°-gravity oil per day through a 9/64-in. choke.

Humble Oil & Refining Co. 17-B G. M. & O. Land Co., 14-9n-8w, Yellow Creek field, Wayne County, was completed on pump for an initial production of 206 bbl. of 18.5°-gravity oil. Total depth is 5,126 ft., with perforations for completion at 5,088-5,121 ft.

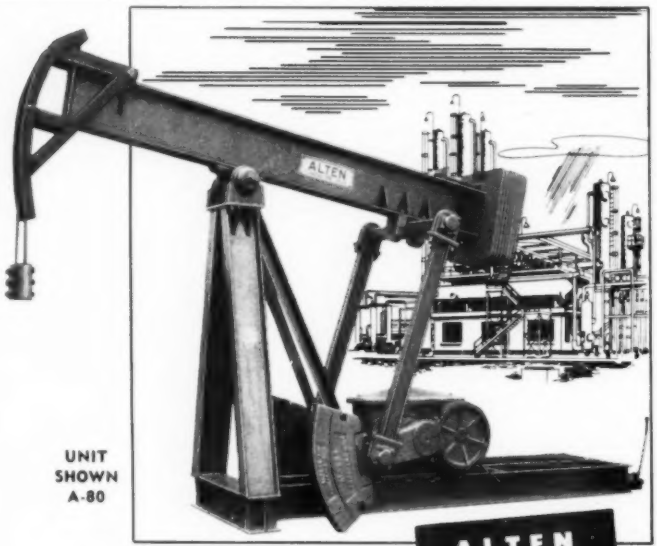
MISSISSIPPI WILDCAT FAILURES

Forrest County: Morgan & Norton 1 Batson & Hatten, 26-1s-13w, dry, TD 8,859 ft. Top Lower Tuscaloosa 8,028 ft., Massive 8,345 ft., Lower Cretaceous 8,668 ft.

Hinds County: Shell Oil Co. 1 Tri-State Brick & Tile Co. et al, NE SW 8-6n-1e, dry, TD 4,410 ft.

Jones County: Walter E. Sistrunk 1 H. C. Powell, NE SW 18-8n-13w, dry, TD 2,068 ft., salt dome discovery "Centerville," top Wilcox 1,788 ft., top Cap Rock 2,032 ft.

Wayne County: J. W. O'Brien et al 1 Lisborn McCann, NW NW 1-8n-6w, dry, TD 6,300 ft. Top Tuscaloosa 5,058 ft., Base Marine Tuscaloosa 5,930 ft., Massive 6,082 ft., Lower Cretaceous 6,275 ft.



UNIT SHOWN A-80

ALTEN PUMPING UNITS

Built to take it-

We don't put Alten Units together like a Swiss watch. They're not built to keep time—but keep PUMPING. No useless, fancy frills; but all the best of alloys, gears and bearings where strain and wear get in their licks. For work-horse efficiency, look to Alten.

Also Casing Heads, Stuffing Boxes, Stop Cocks and other production items.

A-80 FEATURES

★Rigid, all-welded steel Samson Post, Frame and Beam. Structural rating: 7,500 lbs.

★Quality Gear Reducer. Hardened alloy gears and pinions. Roller-bearing equipped. Double reduction ratio: 28.4:1. Torque rating 44,550 in. lbs.

★Adjustable stroke length: 22" to 36".

★Wrist Pin and Equalizer has double-row, spherical, self-aligning roller bearings.

ALTENS

FOUNDRY & MACHINE WORKS, INC.

Lancaster, Ohio

Established 1889

Ask for Name of Nearest Dealer

SOUTH LOUISIANA

East Longville Area Gets Important New Discovery

NEW ORLEANS — An important oil discovery has been made in East Longville area of Beauregard Parish, by Barnsdall Oil Co. 1 M. Jones, Section 3-6s-9w, 3 miles east of Longville oil production. Drilled to a total depth of 8,355 ft., the oil pay was topped at 8,306 ft., and perforations made from 8,320-8,336 ft. On a 12/64-in. choke, the well kicked off flowing at the rate of 392 bbl. of 42.5°-gravity pipeline oil per day with flowing pressure on the tubing at 2,500 psi. Gas-oil ratio 1,450. A net sand body of 35 to 40 ft. of saturated section was penetrated. A string of $5\frac{1}{2}$-in. casing was cemented on bottom.

A new oil pay for Bay Marchand offshore Lafourche Parish has been opened by The California Co. 3 State Lease 1367, in Block 3, State Lease 1367. Hole was drilled to a total depth of 5,526 ft. in the salt, and pipe cemented for completion. Perforations were made from 5,048-5,092 ft., and the well flowed 432 bbl. of 40°-gravity pipe-line oil per day through a 10/64-in. choke. Flowing pressure on tubing was 1,000 psi., gas-oil ratio 400.

In the Breton Sound area of Plaquemines Parish, Barnsdall Oil is testing in the 2 Breton Sound-State Lease 1224, Block 29. Total depth is 10,906 ft., and a 7-in. string of casing has been cemented for protection. Operators are currently testing through perforations in the 7-in. casing from 6,100-6,110 ft. A third test has been located in the Breton Sound area. Barnsdall 3 Breton State, Lease 1224, is located approximately 11,000 ft. southerly from the 2 State. Tools will be moved from the 2 State for work on the new test, which is scheduled to go to 10,000 ft.

SOUTH LOUISIANA SUCCESSFUL WILDCAT

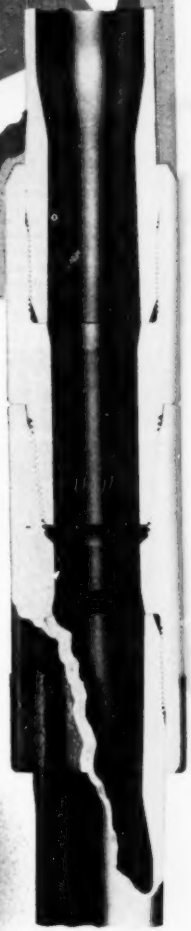
Lafourche Parish: New oil sand Bay Marchand—California Co. 3 State Lease 1367, in Gulf of Mexico, Block 3, TD 5,526 ft., salt, top sand 5,048 ft., perf. 5,048-92 ft., IP 432 bbl. oil per day, 10/64-in., GOR 400, TP 1,000 psi., gravity 40°, no water.

SOUTH LOUISIANA WILDCAT FAILURES

Lafourche Parish: H. L. Hunt 1-A Grandison, in Coffee Bay, 10-19s-23e, dry, TD 12,325 ft.

St. Mary Parish: Atlantic Refg. Co. 1 State Lease 4204, in Northwest Bayou Carlin, dry, TD 11,994 ft.

REED TOOL JOINTS LAST LONGER



ADVANCED METALLURGY gives Reed Tool Joints extra hardness and extra toughness that means longer wear on your rig.

PRE-LUBRICATION infused into the tool joint threads effectively prevents galling during the entire life of the tool joint.

"REEDITE" HARD-FACING, applied to the outside of the tool joint box at the factory assures longer life when you drill in abrasive areas.

Use Reed Tool joints on all your rigs and get the longer life that means lower drill string costs.

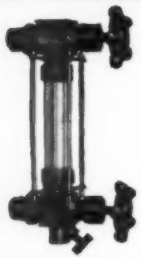
EASY REPLACEMENT IN THE FIELD . . .
is another economy feature you get when you specify Reed Super Shrink-Grip Tool Joints—the favorite of leading operators everywhere.

Reed ROLLER BIT COMPANY

HOUSTON 1, TEXAS

NEW YORK BUENOS AIRES LONDON

PENBERTHY
"ALL IRON"
LIQUID LEVEL GAGES



Body made from a special high strength alloy iron, shanks alloy steel and trim stainless steel. Extra heavy construction throughout, automatic and positive shut-off if glass breaks, heavy duty stuffing boxes. Conform with A.P.I.—A.S.M.E. requirements.

The "All Iron" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Quick Delivery
ON
INTERNATIONAL
TRAC-TRACTORS
and
POWER UNITS
•
LARGE STOCK
PARTS
•
Boyd is one of the largest distributors of International industrial machinery west of the Mississippi.

CLARENCE L.
BOYD
CO.
TULSA, OKLAHOMA

OKLAHOMA

New Pool Indicated by Cleveland County Test

INDICATIONS of the discovery of a new rank wildcat pool in the southern part of Cleveland County are given by showings encountered in the Hunton lime by Teepee Drilling Co. in its 1 Warner, C SE NE 4-6n-1w. Following two drill-stem tests, the first at 6,561-73 ft., and the second at 6,663 ft., 7-in. casing was cemented at 6,548 ft. for production tests. Total depth is 6,655 ft. In the first drill-stem test, gas showed in 40 minutes and 90 ft. of 45° oil and 90 ft. of gas-cut mud was recovered. The second test, with tool open 70 minutes, recovered only 30 ft. of gas-cut mud. Location is east of the town of Lexington.

Discovery of oil in the Wilcox sand is opening a new and deeper pay horizon for the old Summers (Pharaoh) pool in the southwestern part of Okmulgee County. The discovery is in Thomas N. Berry & Co. 1 Kerr, NE NE NW 17-11n-12e. Wilcox was topped at 3,552 ft. and drilled to 3,567 ft. Casing was cemented at 3,550 ft., and after plug was drilled out, the hole filled up 800 ft. with oil. The pool has been producing from various shallower pays since 1915.

The recently opened East Transco Calvin sand pool in Seminole County is being extended a 40-acre location westward by Josaline Production Co. 1 Fore, NE NE NE 27-7n-7e. In a 35-minute drill-stem test at 1,713-36½ ft., 120 ft. of free oil and 40 ft. of oil-cut mud was recovered. Casing (7-in.) has been cemented at 1,711 ft. The location is a half mile west of the discovery well drilled by Ashland Oil & Refining Co. which was completed for 40 bbl. per day at a total depth of 1,756 ft.

Frank Buttram is completing an unusually good well off the northwest side of the South Wayne pool, McClain County, in his 1-A Dunn, NW SE SE 9-5n-2w. From open hole at 7,226-57 ft. in the Hunton zone, the well flowed 575 bbl. of oil in 5 hours after being acidized with 7,500 gal. Placed on 3/16-in. choke, it then flowed at the rate of 11 bbl. per hour with pressures of 960 psi. on the tubing and 850 psi. on the casing.

Bay Petroleum Co. has perforated an additional 13 ft. in its 1 Frank Parkes, NE NE SW 34-4n-8ECM, new pool opener in Cimarron County, Panhandle. Top of perforations now is at 4,791 ft. in the Keyes sand, top of which is 4,775 ft. Casing previously had been perforated at 4,804-19 ft., taking in only the lower part of the Keyes sand and 4 ft. in the Mississippi, where the well flowed on initial test 74 bbl. of 42° oil in 13 hours with gas estimated at 3,150,000 cu. ft. per day. With the additional perforations higher in the sand, it flowed 41 bbl. in the first 11 hours, after which, on a 24-hour gage, it flowed 92 bbl. Both flows were through casing. Before shut in, production was reported to have been increasing.

OKLAHOMA SUCCESSFUL WILDCAT

Oklahoma County: Skelly 1 Corbin, NW SE SW 5-12n-2w, pumped 40 bbl. of oil per day from conglomerate at 5,602-30 ft., TD 6,410 ft.

OKLAHOMA WILDCAT FAILURES

Atoka County: Logan 1 Jones, NE NE NW 29-3s-12e, dry, TD 2,999 ft. in shale, sand 1,250 ft.

Cotton County: Hutcheson 1 Adams, NW NW NW 33-3s-12w, dry, TD 1,850 ft.

Lincoln County: Deardorf 1 Collier, NW NW NE 34-12n-3e, dry, TD 5,706 ft., basal Pennsylvanian - Mississippi lime 4,854 ft., Woodford 5,254 ft., Sylvan 5,388 ft., first Wilcox 5,555 ft., second Wilcox 5,652 ft.

Davon 1 Didlake, SE SE NE 24-12n-4e, dry, TD 4,620 ft., Belle City 2,435 ft., Hogshooter 2,696 ft., Checkerboard 3,082 ft., conglomerate 3,130 ft., Oswego 3,919 ft., Prue 3,923 ft., Verdigris 4,024 ft., upper Skinner sand 4,131 ft., lime 4,258 ft., Red Fork 4,273 ft., Bartlesville 4,332 ft., Inola 4,525 ft.

Logan County: Mid-States 1 Hower, C NE SW 29-15n-2w, dry, TD 6,456 ft.

Collery 1 Ferguson, NW NE SW 13-19n-3w, dry, TD 6,072 ft., Viola 5,826 ft., first Wilcox 5,980 ft., second Wilcox 6,052 ft.

Okmulgee County: Gill 1 Heneha, NW NW NE 7-12n-13e, dry, TD 3,097 ft.

Osage County: Continental 1 Osage, NE NE NE 7-22n-7e, dry, TD 3,125 ft., Mississippi lime 2,767 ft., Wilcox 2,899 ft., Arbuckle 3,100 ft.

Peters 1 Osage, NW NW SW 14-26n-5e, dry, TD 3,053 ft., Layton 2,122 ft., Burbank 2,948 ft.

Payne County: Summitt Drilling 2 Randolph, SW SW SE 11-19n-1w, dry, TD 4,965 ft., Mississippi lime 4,694 ft., dolomite 4,806 ft., sandy dolomite 4,820 ft., Sylvan 4,840 ft., Viola 4,876 ft., Wilcox 4,958 ft.

Oliphant 1 Lile, NW SW SE 10-19n-3e, dry, TD 3,942 ft.

Stephens County: Strother 1 State, SW NE NE 16-3s-8w, dry, TD 3,110 ft.

MICHIGAN

Barry County Well Finds Traverse Pay

MOUNT PLEASANT. — Fisher-McCall Oil & Gas, Inc., 1 Steckle, SE NE NW 6-4n-8w, Carlton Township wildcat, Barry County, logged an interesting Traverse oil pay at a total depth of 2,034-35 ft. which filled the hole with oil to flow point in 20 minutes after pay was tapped. Control head was closed before a flow was made. Traverse lime objective was logged at 2,007 ft., about 29 ft. higher structurally than closest control check point.

Well was killed with mud in preparation for casing with 5-in. at 1,966 ft. where pipe will be cemented. Wildcat, located on a 2,000-acre block, although drilled under the name of Fisher-McCall Oil & Gas, Inc., was arranged by Byron MacCullum, co-discoverer of the Walker field, Kent County, which was opened and developed in 1939. New Barry County strike appeared to most observers to be the best looking prospect yet drilled in the district, and was expected to stimulate renewed interest in southwest Michigan.

Carter Oil Co. 3-T Dumaw, Pentwater field Traverse well, Oceana County, was brought under control after 40 hours of wild flowing which fired and completely ruined drilling machine. Oil loss was estimated at between 4,000 and 5,000 bbl. Loss to drilling machine and equipment was placed by contractor at $30,000. Well was snuffed out by pumping mud and water into the roaring inferno. A 2-in. line was snubbed into the wellhead after fire and oil flow had declined to a point where well was flowing by heads at the rate of once every 90 seconds for a 60-second period.

MICHIGAN SUCCESSFUL WILDCAT

Gladwin County, Beaverton Township: W. L. McClanahan 1 Rhinehart, NE NE NW 6-17n-2w, Dundee 3,880 ft., pump 50 bbl., TD 3,948 ft., PBTD 3,944.

MICHIGAN WILDCAT FAILURES

Allegan County, Allegan Township: J. W. Lang Co. 1 Kovack, NE NE NE 1-2n-13w, Traverse 1,580 ft., dry, TD 1,587 ft.

Lee Township: William C. Vandenberg, Jr., 1 Hambley, NE SW NE 19-1n-15w, Traverse 1,153 ft., dry, TD 1,157 ft.

Valley Township: Ohio Oil Co. A-44 U. S. of America CT, SE SE SE 4-2n-14w, Traverse 1,377 ft., dry, TD 1,4[illegible] ft.

Montcalm County, Cato Township: Mercer Oil Co. & Leslie T. Barber 1 Svendsen et ux, SW SW SW 12-12n-8w, Marshall 1,316 ft., dry, TD 1,319 ft.

Cato Township: Union Development Co. 1 Laper, NW NE NE 19-12n-8w, Monroe 3,475 ft., dry TD 3,611 ft.

Oceana County, Weare Township: Harry L.

Parker 1 Patterson, NE NW SW 18-16n-17w, Dundee 2,197 ft., dry, TD 2,215 ft.

KANSAS

Rice County Wildcat Has Good Flow From Lansing

PLUGGED back from the Quartzite where it swabbed a small amount of oil, Anderson-Prichard Oil Corp.'s new pool opener, 1 Ringwald, NE SE NE 32-18-16, in Rice County, flowed 206 bbl. of 40.3° oil and 3 bbl. of water in 13½ hours through 1-in. choke from the Lansing. Later in an 18-hour test through ¼-in. choke it flowed 84 bbl. and no water.

Tests were made through casing perforations at 2,947-52 ft. following a 2,000-gal. acid treatment. Top of Lansing is at 2,856 ft. (minus 1,108 ft.). Plug is at 3,020 ft. with bottom of the casing at 3,067 ft., where it had been cemented to test showings in the Quartzite at 3,080-90 ft. The recovery is 1½ miles south of the North Orth pool and 2 miles southwest of the Orth pool.

In the southeastern part of Barton County, Bay Petroleum Corp. 1 Krone, SW SW SW 30-20-12, swabbed at the rate of 3½ bbl. per hour after deepening to 3,531 ft. in the Arbuckle, topped at 3,490 ft. (minus 1,617 ft.). It was given two acid treatments of 500 gal. each. Location is 1 mile northeast of the Rolling Green pool and 2½ miles south of the recently opened Sunny Valley pool.

Lindas Oil Co. and National Cooperative Refinery Association 1 Parker, SW SW SW 7-15-12, ¾ mile northwest of the Parker pool, southern Russell County, swabbed and flowed at the rate of 21 bbl. per hour with casing perforated at 3,086-3,102 ft. in the Lansing, topped at 3,016 ft. (minus 1,160 ft.). It probably is a new pool and has been designated as Northwest Parker. Hole has been drilled to the Arbuckle, topped at 3,300 ft.

Skelly Oil Co. 1 Bartlett, SE SE NE 20-27-11, 3 miles northwest of the Cunningham field in eastern Pratt County, recovered 60 ft. of oil and gas-cut mud in a 40-minute drill-stem test of the Viola lime at 4,353-91 ft. Viola was topped at 4,346 ft. (minus 2,518 ft.). It is being deepened. A drill-stem test of the Simpson at 4,431 ft. showed water.

Carter Oil Co.'s Forest City basin, Viola lime, discovery well, 1 Davis, SW SE SW 33-12-10e, Wabaunsee County, has been placed on the pump following previously reported flowing tests. It pumped 500 bbl. in 50 hours while cleaning, and then made 145 bbl. in 8 hours. Production is from a total depth of 3,206 ft., with casing at 3,202 ft.

KANSAS SUCCESSFUL WILDCAT

Ellsworth County: Ferrell et al 1 Rous, SW SW SE 31-16s-10w, 48 bbl. of oil per day from Arbuckle, TD 3,394 ft.

KANSAS WILDCAT FAILURES

Barton County: J.-L. Drilling 1 Hulme, SE SE NW 16-20s-12w, dry, TD 3,507 ft., Arbuckle 3,467 ft.

Adair 1 Heminger, SW SW SE 6-20s-13w, dry, TD 3,505 ft., Arbuckle 3,488 ft.

Graham County: C & G Drilling et al 1 Hunt-Behrens, NE NE SE 12-10s-21w, dry, TD 3,886 ft., Lansing-Kansas City 3,468 ft., Arbuckle 3,879 ft.

Ottawa County: Westgate-Greenland 1 Scholtz, CSL SW SE 22-10s-2w, dry, TD 3,504 ft., Mississippi lime 2,797 ft., Kinderhook 3,184 ft., Hunton 3,184 ft., Sylvan 3,362 ft., Viola 3,456 ft.

Rooks County: Westgate-Greenland 1 Muir, SW SW SE 20-6s-17w, dry, TD 3,515 ft., Heebner 3,077 ft., Lansing-Kansas City 3,120 ft., Arbuckle 3,463 ft.

Russell County: Alexander 1 Shaffer, SE SE NE 11-13s-15w, dry, TD 3,260 ft., Arbuckle 3,241 ft.

B & R Drilling et al 1 Polcyn, SE SE SW 19-13s-15w, dry, TD 3,400 ft., Heebner

Cut Maintenance-Cleaning Costs on These Six Jobs!

NOW'S a good time to check over your maintenance cleaning procedures . . . put them on a time-saving basis with Oakite cleaning. Widely used Oakite materials and Oakite techniques are specially designed and tested to clean quickly, easily, economically. So call in your nearby Oakite Technical Service Representative . . . have him size up your cleaning jobs.

1. Cleaning Tank Car Interiors
2. Cleaning Heat Exchangers
3. Cleaning Lube Oil Coolers
4. Salvaging Valves, Fittings
5. Descaling Diesel Engines
6. Cleaning Filters

FREE Details

Complete technical data is contained in the 28-page Oakite Petroleum Digest of 88 typical maintenance cleaning tasks. We'll be glad to mail you a copy FREE. Both Oakite service and literature yours for the asking!

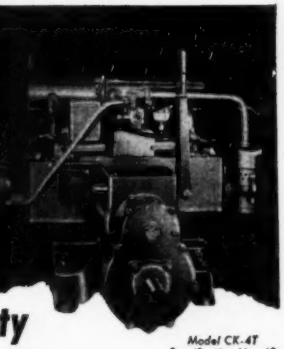
OAKITE PRODUCTS, INC., 44G Thames St., NEW YORK 6, N. Y.

OAKITE MATERIALS METHODS SERVICE

Specialized Industrial Cleaning

Technical Service Representatives in Principal Cities of U. S. & Canada

ONAN "CK" Oilfielder ENGINES



Built for Continuous Duty on Tough Pumping Jobs!

Do you have a job for a 5½ HP roughneck? Here's a dependable 1000-inch-pound torque engine that will do a job for you day-in and day-out with minimum maintenance and attention. No cooling problem because it's air-cooled. Little or no sludging. Has features of an engine many times its size. Smoother-running because of its twin-cylinder, horizontally-opposed engine.

Full pressure lubrication by gear-type oil pump. Runs on either gas or gasoline. Check with your supply house or write. ONAN OILFIELDER ENGINE—5½ HP. ONAN ELECTRIC PLANTS—A.C. 350 to 35,000 watts. D.C. 1200 to 15,000 watts. Gas-gasoline and Diesel models.

Model CK-4T Specification No. 49 5½ HP (API)

• 1000-inch-pound torque • 5½ HP continuous duty (by API formula) • 960-ft. piston speed • 525 PTO shaft speed through 4.1 gear reduction • Over-center dry disc clutch • 4-quart oil sump • Air-cooled by axial-flow blower.

D. W. ONAN & SONS INC.

5786 Royalston Avenue • Minneapolis 5, Minnesota

Onan PRODUCTS ENGINES & ELECTRIC PLANTS

3,066 ft., Lansing-Kansas City 3,102 ft., Arbuckle 3,370 ft.

Stafford County: Westgate-Greenland 1 Alphine, SW SW SW 12-21s-13w, dry, TD 3,594 ft., Arbuckle 3,552 ft.

Phillips et al 1 Payne, SW SW NE 8-21s-12w, dry, TD 3,522 ft., Lansing-Kansas City 3,244 ft., Arbuckle 3,496 ft.

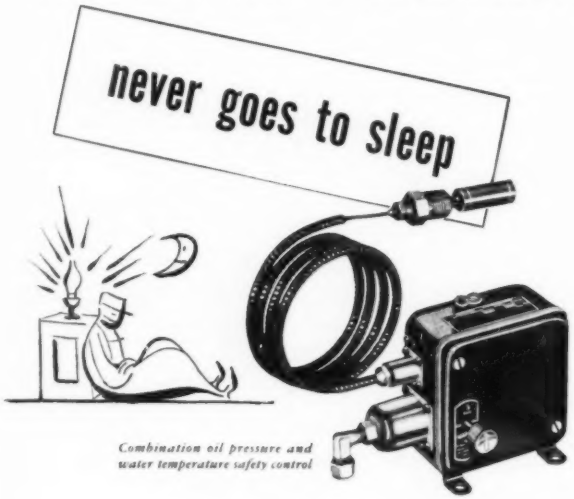
APPALACHIAN FIELD

Kanawha County Test Continues in Medina

PITTSBURGH.—In Loudon District, Kanawha County, West Virginia, Owens, Libbey-Owens No. 20-769 Great Kanawha Petroleum Coal & Lumber Co., elevation 1,104 ft., reported drilling at a depth of 6,073 ft. in the White Medina sand, topped at 6,047 ft. In Grant District, Ritchie County, Hope Natural Gas Co. No. 9300 Jessie Powell, elevation 1,006 ft., Oriskany sand 5,656-5,760 ft., was dry, and drilling stopped at a depth of 5,810 ft. The well will be plugged back to test oil encountered at 2,775-80 ft. In Portland district, Preston County, this company's No. 9315 P. S. Pyles, elevation 2,197 ft., stopped drilling operations at 6,086 ft. and shot the gas pays in the Oriskany sand but did not increase the flow to any appreciable extent; No. 2-9332 J. Paul Martin, elevation 1,989 ft., logged the Onondaga chert at 4,900 ft. and casing is now being run.

In Conemaugh Township, Indiana County, Pennsylvania, T. W. Phillips Gas & Oil Co. No. 1 J. A. Rose resulted in a good gas well, gaging 1,254,000 cu. ft. in the shallow sands, total depth 1,807 ft. In Napier Township, Bedford County, South Penn et al-Snee & Eberly No. 1 Jesse B. Miller, elevation 1,66 ft., is drilling at 3,393 ft. In Derry Township, Westmoreland County, Peoples Natural Gas Co. No. 4-3814 Camilla Giffin, elevation 2,238 ft., encountered a bad hole at a depth of 8,658 ft.

THIS ENGINE PROTECTION



Combination oil pressure and water temperature safety control

Day and night this "automatic watchman" protects engines from serious damage. If cooling water temperature rises or oil pressure fails this Penn safety control gives a danger signal or stops the engine. This prompt detection of motor trouble heads off breakdowns and costly production delays. By making it possible to complete minor repairs and adjustments *in time* it eliminates most big repair bills.

Other Penn safety controls operate from either oil pressure or water temperature. Like the combination control they will (1) sound an alarm or light a warning light, or (2) stop the engine, or (3) sound or light an alarm and stop the engine. These safety controls can save money on your engine operation, too. Write for free bulletin E-100B giving full details. **Penn Electric Switch Co., Goshen, Indiana.** Export Division: 13 East 40th Street, New York 16, U. S. A. In Canada: Penn Controls Ltd., Toronto, Ontario.

PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

CANADIAN FIELDS

Canadian Discovery Has 50 Ft. of Devonian Pay

CALGARY.—Canada's newest discovery well, Canadian Gulf Oil Co.'s N. J. Ellis No. 1, has obtained 50 ft. of D2 Devonian pay zone above the water line. Indicated potential, on the basis of several drill-stem flow tests, is believed to be around 1,300 bbl. daily. The crude oil is in the gravity range between 30 and 32° A.P.I.

The well, located in LSD 4, 10-38-20w4, is about 100 miles northeast of Calgary and 6 miles southeast of Stetler town. D2 Devonian zone was topped at 5,184 ft., showing around 50 ft. of prolific porosity prior to reaching the water level. Now coring at 5,250 ft., crew expects to obtain D3 zone answer within the next 200 ft.

Golden Spike.—Imperial - Golden Spike No. 2, Imperial Oil's first stepout venture from the famed Schoepp No. 1 Golden Spike D3 oil discovery, has encountered salt water in the D2 zone. The No. 2 test, located in LSD 2, 1-52-27w4, is about 3 miles northeast of the rich 10,000-bbl.-per-day flush Schoepp producer. During drill-stem test of interval 5,217-37 ft., Golden Spike No. 2 obtained a pipe recovery of 810 ft. of salt water. Crew are now continuing below 5,253 ft., in search of the D3 zone, source of production from the discovery well.

Leduc.—The McConset Group of three Calgary independent oil companies has assured oil success at their key Leduc extension test. Location is on a quarter section farmout lease from Imperial in LSD 16, 34-49-26w4. Aside from assurance of production from D3 zone, the McConset Leduc No. 2 well makes news because it has indicated a rise of the D3 to the south of previously established oil limits and may thus add materially to the extent and reserves of Leduc field.

The D3 zone of Devonian was contacted at 5,344 ft.; a subsea elevation of 2,943 ft. First drill-stem test, run near top of D3 with packer set around 5,345 ft., gave a large natural gas flow measured at 2,000,000 cu. ft. daily. The hole was carried down and a second test was run to about 5,396 ft. During this test oil flowed at about a 15-bbl. hourly rate, with little gas showing. With current bottom at 5,406 ft., crew are preparing to run 5-in. liner preliminary to jet perforating and placing the well on production.

The three independent backers, each with one-third interest, are: Alberta Pacific Consolidated Oils, Ltd.; McDougal-Segur Exploration Co., Ltd.; and Sunset Oils, Ltd.

Manowan Lake.—About 28 miles northwest of Edmonton, the Bailey-Long Island No. 1 venture, in the Manowan Lake area, has completed as a natural-gas discovery well in the Lower Cretaceous. The well, situated in LSD 10, 28-57-25w4, found D3 Devonian coral-reef conditions present but also found the D3 water-bearing. The venture was completed at 4,295 ft., and plugged back to 3,550 ft. where the Lower Cretaceous gas horizon was encountered.

A natural-gas potential in excess of 4,750,000 cu. ft. daily has been established, and the well is standing capped, pending opening of a market.

Woodbend.—Husky Oil & Refining, Ltd., Canadian subsidiary of Husky Refining Co. of Wyoming, and Glasgow Oils, Ltd., of Vancouver, have obtained their first Woodbend area production. The successful well, Husky-Glasgow Woodbend No. 1, LSD 1, 13-51-26w4, northwest offset of the group of Continental Oil of Canada Lower Cretaceous oil wells, was started on produc-

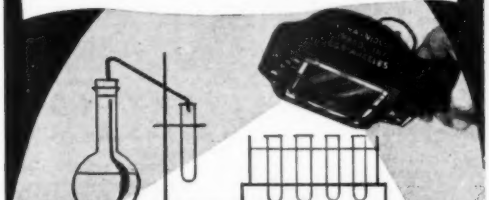
TOUGH and TRUE
TURNBUCKLES
by Norris Brothers, Inc.

HUNDREDS OF THOUSANDS IN USE ALL OVER THE WORLD . . .

• Norris Brothers Turnbuckles are made perfectly true by a special straightening process. Ends are tapped in line, assuring true concentric pull. And as for toughness, we've turned them inside out and twisted them into a pigtail braid without a sign of fracture. Made in sizes and types to fit most needs. Ask your supplier, or write for circular.

Norris Brothers, INC.
ROBINSON · ILLINOIS

Fluorescent Analysis...

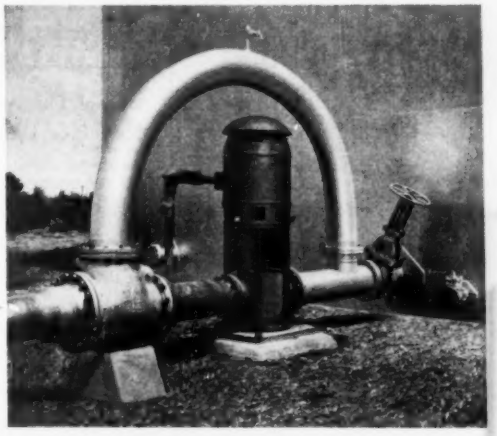


Use MINERALIGHT
for faster identification

● In the oil fields or laboratory, MINERALIGHT is proving to be of great aid in analysis. This handy Ultra-Violet light, available in portable or laboratory models, makes routine tests faster and easier. Laboratory units operate on 110 volts A.C. For information on how MINERALIGHT can aid by fluorescent analysis, write for bulletin 0-200.

Ultra-Violet PRODUCTS, INC.
5205 Santa Monica Blvd., Los Angeles 27, Calif.

Need a Boost?

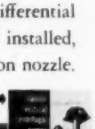


Pacific TYPE WY VERTICAL CENTRIFUGAL PUMPS
are always ready to give that needed boost—

. . . at the Tank Farm
. . . at the Pump Station
. . . along the Pipe Line

PACIFIC Type WY Booster Pumps are available for capacities to 150,000 bbls. per day with differential pressures to 500 p.s.i. Economical—easily installed, requires *one foot or less* N.P.S.H. at suction nozzle.

Write for Bulletin No. 105



PACIFIC
Precision Built
PUMPS

25th ANNIVERSARY

PACIFIC PUMPS INC., *Huntington Park, California*
One of the Dresser Industries
Export Office: Chanin Bldg., 122 E. 42nd St., New York
Offices in All Principal Cities PL-2

PENBERTHY
SUMP PUMPS

Used wherever seepage water accumulates, the Penberthy Automatic Electric Sump Pump and the Penberthy Automatic Drainer (water or steam operated) have demonstrated their superiority in this service. Simple and rugged design—copper and bronze construction throughout.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

CONTROL ALGAE AND SLIME
Paddock CHLORINATORS

Operates on high vacuum . . . no moving parts. 8 capacity ranges — 15 lbs. to 2000 lbs. of chlorine per 24 hours. Also ideal for chlorinating drinking water.

Paddock Sales of Texas
Sales Agent for Paddock Engineering Company of Texas
3727 Alvedo • M-K-T Bldg. Houston 2, Texas

tion test. On former drill-stem test, the well showed a substantial flow of oil and gas without sign of formation water. Completion depth, in the Lower Cretaceous sands, was 4,285 ft.

Wildcat abandonments.—Time Oils No. 1 LSD 12, 26-64-13w4, TD 2,551 ft. Imperial-Gibbons No. 1, LSD 2, 16-56-22w4, TD 6,640 ft. Texaco-McColl Telfordville No. 2, LSD 16, 11-50-2w5, TD 5,345 ft.

SOUTHWEST TEXAS

Duval County Gets New Oil Discovery

CORPUS CHRISTI.—A new oil discovery for Duval County has been completed 1 mile northwest of Chiltipin field and 12 miles north-northwest of San Diego. W. L. Goldston 2 Ed Canales, in SA&MG Survey 2, A-529, was drilled to a total depth of 4,500 ft., with pipe cemented to 4,200 ft. for the completion. On a 24-hour test, the well flowed 100.74 bbl. of 44°-gravity oil per day with flowing pressure on tubing at 640 psi., through a ⅛-in. choke. Pressure on casing was 750 psi. Production is through perforations at 4,151-4,155 ft. Gas-oil ratio 720.

LaGloria Corp. 4 Arthur A. Seeligson, semi-wildcat in area between LaGloria field and Blucher field, southern Jim Wells County, has been completed to link production between these two fields. Total depth is 8,184 ft., with 7-in. casing set to 8,025 ft. Through perforations at 7,028-30 ft., the well tested gas-condensate through ¼-in. chokes, with 1,500 psi. working pressure in 1½ hours. Additional perforations were made from 7,022-30 ft., and 7,005-17 ft., and drill-stem test using ¼-in. chokes developed 1,475 psi. working pressure, open 1½ hours, recovering 290 ft. of condensate-cut mud. Well now is completing through a 5/16-in. choke, with 2,025 psi. tubing pressure. No gage has been reported.

Oil production in another semi-wildcat between Blucher and Seeligson field, ¼ mile southeast of Premont townsite, has been indicated. LaGloria Corp. B-1 Arthur A. Seeligson, in Section 29, Haldeman Subdivision of Seeligson tract, recovered 100 ft. of oil and 20 ft. of oil, mud and salt water emulsion, on a drill-stem test through perforations at 6,242-45 ft., using ¼-in. chokes.

A new oil pay zone at the Alfred field in Jim Wells County, has been opened at Morris Cannan 1 O. S. Adams, which flowed several barrels of oil per hour through a ⅛-in. choke on initial test through perforations at 4,575-81 ft. Tubing pressure 750 psi., casing sealed. Well now is shut in for storage. This producer is located in Wm. Adams Survey 5. Total depth 5,110 ft., with 5½-in. production string set to 4,620 ft.

H. R. Smith, Inc., et al 1 Max Otto, a ½-mile northeast extension of Weigang field, Atascosa County, recovered 275 ft. of pipe-line oil on a 20-minute test using ¼-in. and ⅜-in. chokes through perforations at 3,873-75 ft. Total depth is 3,875 ft.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Bastrop County: The Hathaway Co. 1 R. W. Hill, in Antonio Navarro League, near Lyceum, 1 mile west of Jim Smith field, dry, TD 2,203 ft.

Bexar County: Baker Oil Co. 15 E. M. Baker, in F. Rolen League and Labor Sur. 48, 1½ mi. SE of Von Ormy, dry, TD 1,302 ft.

Duval County: Humble Oil & Refg. Co. 1 Bertha F. Dinn, in J. Cuellar Sur. 20, 10 mi. SW of San Diego, dry, TD 7,443 ft.

Magnolia Pet. Co. 2 Duval-State, in J. Poitevent Sur. 52, 3 mi. NW of Freer, dry, TD 2,400 ft.

Webb County: Daubert & Aching 1 A. M. Bruni Est., Block 12, Brown Subd., Albercas Grant, 10 mi. S of Mirando City, ½ mi. E of Aviator field, dry, TD 1,835 ft.

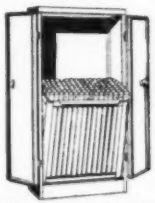
Gordon W. Johnson 1 Dan Adami, H&GN Sur. 1, 4 mi. SW of Adami field, dry, TD 1,005 ft.

Killam, Daubert & Achning 1 S. Vasquez, Sur. 134, 2 mi. W of Bruni, old well drilled deeper, dry, TD 4,064 ft.

Zapata County: Bridwell Oil Co. 1 R. G. Rodriquez-State, in F. G. Martinez Sur. 264, 20 mi. NE of Falcon, 3 mi. SE of Charco Redondo field, dry, TD 1,998 ft.

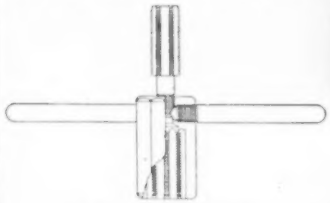
Louis Franklin 1-A Antonio Cuellar et al, in Charco Redondo Grant, 20 mi. SE of Zapata, dry, TD 1,736 ft.

Manforth Oil Co., Ltd., 1 Serapio Vela, in Blk. 57, Sh. 2, El Grullo Grant, 17 mi. NE of Lopeno, 2½ mi. NW of Joe Moss field, dry, TD 3,332 ft.



MAP FILE
#MT4
PATENT No. 1610368
Other Patents Pending
DELIVERY NOW
AT LAST an easy way to file and find large maps and tracings—
METAL CABINET - LOCK
SCOTT-RICE COMPANY
617 S. Main Tulsa 3, Okla.

CLEANOUT TAP and DIES
for BLOWOUT PREVENTER STUDS



⅝" THRU 2" — API

Patent No. 2110618

DRILLING TOOLS
by Baird
•
THRU YOUR SUPPLY STORE
BAIRD MFG. CO.—TULSA

ROCKY MOUNTAIN

Superior Runs World's Longest Casing String

DENVER.—The longest and heaviest string of casing in history has been run at Superior Oil Co. 1 Unit, SW NE SW 27-27n-103w, at Pacific Creek, Sublette County, Wyoming. At 19,765 ft., total depth, the 7-in. casing was cemented. The operator is now preparing to deepen the well below this depth. The well passed Superior's own previous depth record, established recently near Ventura, Calif., at 18,734 ft. A total of approximately 400 days drilling time has been required to drill the well to its present depth. Superior is still keeping the operation a tight hole, with no release of formation information or shows below 10,000 ft. Shows of oil and gas have been rumored below that depth, but these are not confirmed. In the meantime, plans are reported for drilling other wildcats below the 10,000-ft. level in this area of Wyoming. Sinclair Wyoming Oil Co. has a unitized block immediately adjoining on the east side of the Superior Pacific Creek. Stanolind Oil & Gas Co., Standard of California, Mountain Fuel Supply Co., Union Oil Co., and others have blocks on surface Tertiary structures in the Green River Basin and reportedly plan deep tests on these in the immediate future.

Amerada Petroleum Corp. recovered 100 ft. of oil, 90 ft. of oil-cut mud and 370 ft. of water on drill-stem test in the Sundance between 7,647-7,668 ft. at its Sage Spring Creek wildcat at 1 Unit, C SW SE 30-37n-77w, Natrona County, Wyoming. The recovery was on 6-hour test in this zone. The operator is continuing to test, with the possibility that the well may make a small discovery.

Several wildcats in the eastern and south-central area of Utah are now at interesting depths, and discovery at any of these will increase the exploratory activity, now at an all-time high in the state. Pacific Western Oil Co. and Equity Oil are again drilling at the 1 Unit, C NW SW 33-21s-21e, Thompson wildcat, with the well now below 11,119 ft. Formation tops below 2,500 ft. have not been announced by the operator but the well is believed to be in Pennsylvanian formation. It is reported the well may be drilled below 14,000 ft. for a test through Mississippian beds. Further west in the Green River Basin Amerada Petroleum Corp. is now below 4,456 ft. at its second wildcat on the Green River unit. The well offsets to the southwest one recently abandoned by Amerada at 5,645 ft., total depth, in Paradox salt. The first well flowed gas and condensate prior to making water from the Paradox and the well was abandoned reportedly in junked condition. On the south side of this Basin Tide Water Associated Oil Co. has lost-circulation difficulties at 6,368 ft. at the 74-11, NW NW SW 11-26s-19e, Big Flat Unit. This well topped the Paradox salt at 4,265 ft. and had shows of oil, possible commercial, in Paradox above the salt.

WYOMING WILDCAT FAILURES

Glasner Dome, Fremont County: Southern Production & G. G. Travis 1 Unit, NW NW NE 36-34n-91w, 7,826 TD, abnd., Frontier 4,192, Muddy 5,367, Dakota 5,538, Fuson 5,559, Lakota 5,581, Morrison 5,598, Gypsum Springs 6,107, Dinwoody 7,380, Phosphoria 7,460, Tensleep 7,806.

Blue Springs, Hot Springs County: Deep Rock Oil 1 Gov't., SE SE NW 31-43n-92w, 3,342 TD, abnd., Dinwoody 2,445, Phosphoria 2,500, Tensleep 2,697, Amsden 3,000, Madison 3,280.

Newcastle Area, Weston County: Rock Creek Oil Co. 1 Hulse, SE NW NW 30-44n-61w, 2,970 TD, abnd., Newcastle 2,862.

COLORADO WILDCAT FAILURES

Missouti Canyon, Larimer County: Florence Drilling 1 Sprenger, C NE SW 24-6n-69w, 249 TD, abnd.

Denver, Denver County: H. Thebault 1 State, SE SW NW 16-4s-68w, 1,251 TD, abnd.

TEXAS GULF COAST

Discovery Reported Near Goebel Field

HOUSTON.—Henderson Coquat 1 W. W. Goebel & Sophia Goebel, a new discovery 1½ miles north of the Goebel field in Live Oak County, has been gaged at 30 bbl. of 37°-gravity oil and approximately 1,000,000 cu. ft. of gas per day through a ½-in. choke, with 600-psi. working pressure, and 2,500-psi. shut-in pressure, through perforations at 6,565-86 ft. After gaging this flow through separator into tanks, the well was reperforated at 6,642-50 ft., apparently for dual completion. The production gage was made in the Slick sand and the lower perforations are in the Luling sand of the Carrizo-Wilcox series. Total depth is 7,160 ft., with 5½-in. casing at 6,780 ft. This well is located in Refugio County School Land Survey 6, 4 miles northeast of Oakville.

A new gas-condensate field has been opened in northern Orange County, ½ mile southwest of South Gist pool. Houston Oil Co. of Texas A-1 Newton County Lumber Co., located in the John Collier Survey, Abstract 55, was drilled to a total depth of 7,500 ft., with 5½-in. casing cemented to 7,355 ft. Perforations for completion were made from 7,326-7,332 ft., and the well

The Tulsa Winch mounted on the Leland Oil Field Truck Body is an unbeatable "pair" for better pipe line service. This "Packaged Unit" is fabricated to standard truck specifications for easier "on-the-spot" field installation. The simplicity of design and few moving parts of the Tulsa Winch provide years of dependable trouble-free service. The Leland Oil Field Truck Body represents a high mark in achievement that has evolved from Leland's twenty years' experience in building truck and trailer bodies.

Write for further details on Leland's "Packaged Unit"

COMPLETE PARTS AND SERVICE ON ALL LINES CARRIED

Leland
EQUIPMENT COMPANY
OKLAHOMA CITY • TULSA • LONGVIEW, TEXAS

kicked off and came in flowing an unestimated amount of gas and condensate with flowing pressure on the tubing at 2,600 psi. Well has been shut in for connection.

Federal Royalty Co. and R. A. Welch 3 Myra S. Pryor has been completed as a new gas-condensate discovery in the New Taiton area of Wharton County. Located in William Robinson Survey, Abstract 55. The well was drilled to total depth of 10,834 ft. On potential gage the well flowed at the rate of 3,500,000 cu. ft. of gas per day and 70 bbl. of 45.2°-gravity condensate through a ¹⁄₄-in. choke with tubing pressure at 7,015 psi. Production is through open hole from 10,820-10,834 ft. in the Wilcox sand. Open flow calculation was estimated at 9,800,000 cu. ft. per day. Gas-oil ratio 50,000. Shut-in pressure on tubing is 7,300 psi.

Rowan Oil Co. and Texas Gulf Producing Co. 2 Denman Kountze et al, ¾ mile northeast of the Arch field, Matagorda County, is completing as a new oil producer. Drilled to a total depth of 8,720 ft. with perforations at 7,641-43 ft. for the initial test. Well kicked off and now is flowing through a ¹⁄₄-in. choke, making approximately 6 bbl. of fluid per hour, showing oil and wash water with 1,600-psi. flowing pressure on tubing and 2,000 psi. casing pressure. Flow is from the middle section of the Frio pay.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Live Oak County: New gas-condensate discovery—Magnolia Pet. Co. et al 1 Block 85 Unit, in Block 85, Dr. C. F. Simmons Subd., 6 mi. S-SW of Simmons City, top pay 7,845 ft., TD 8,524 ft., perf. 7,845-79 ft., IP: 4,603,000 cu. ft. gas per day through 5/16-in. choke, plus 35.52 bbl. oil per day condensate, TP 1,126 psi., shut-in pressure 2,406 psi., gravity 56.8°.

Montgomery County: New gas-condensate discovery—Amerada Pet. Corp. 1 H. A. Godejohn, in M. B. Lawrence Sur., A-310, 3 mi. SE of Fosteria townsite, TD 13,691 ft., top sand 5,620 ft., Cockfield, perf. 5,620-28 ft., IP: 2,427,000 cu. ft. gas per day and estimated 30 bbl. condensate per day through 12/64-in. choke, TP 2,043 psi., shut-in pressure 2,102 psi., gravity 61° estimated, no water.

Wharton County: New gas-condensate discovery—Federal Royalty Co. and R. A. Welch 3 Myra S. Pryor, in Wm. Robinson Sur. A-55, 6 mi. SE of New Taiton, TD 10,834 ft., in sidetracked hole, top sand 10,820 ft., perf. 10,280-834 ft. open hole, IP: 2,500,000 cu. ft. gas per day and 70 bbl. condensate per day through ¹⁄₂-in. choke, GOR 50,000, open flow calculation 9,800,000 cu. ft. gas per day, TP 7,015 psi., shutin pressure 7,300 psi., 45.2° gravity.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Bee County: H. R. Smith and Seaboard Oil Co. Bernard W. Seger, in Geo. O'Docharty Sur. A-49, 5 mi. S of Beeville, dry, TD 4,315 ft.

Galveston County: Union Oil Co. of Calif. 1 Harry S. Palmer et al, in S. F. Austin Sur. A-3, League Sity area, dry, TD 10,797 ft.

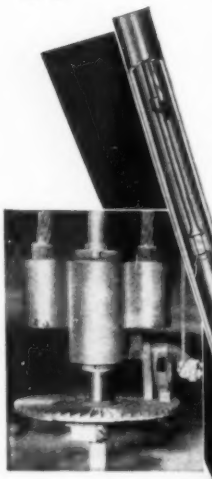
Jackson County: Sun Oil Co. A-1 Francitas Unit, in Blk. 9 Francitas Farms, 2 mi. NE of Francitas townsite, Mary E. Johnson Sur., dry, TD 10,602 ft.

Jefferson County: Sun Oil 1 Beavers, T&NO Sur. Sec. 31, dry, TD 8,504 ft.

Montgomery County: The Moran Corp. 1 Hutchings-Sealy Nat'l Bank, J. C. Pitts Sur., 4 mi. NE of Conroe, dry, TD 6,530 ft.

Wilson County: Wise Drilling Co. 1 Emile Dugi, in David J. Holt Sur., 6 mi. NE of Poth, dry, TD 4,669 ft.

WHAT ARE YOU PAYING FOR PARAFFIN REMOVAL?



HUBER ROTATING ROD HANGER

This rod hanger rotates the rod string a fraction of a turn on each reciprocation. Two ratchet levers, operated by a flexible cable extending from the walking beam, engage the teeth in the turntable to turn the rod string.

Sold through supply stores.

TOO MUCH — If your pumping wells are not equipped with HUBER SCRAPERS

Many major companies report Huber Scrapers have completely eliminated paraffin removal costs or reduced them to only a fraction of a cent per barrel of oil produced. Huber Scrapers, shrink-fitted to new or used sucker rods, scrape the paraffin from the tubing wall as the string rotates and reciprocates. Rods are rotated by the special Huber Rotating Rod Hanger.

Reduce or eliminate your paraffin removal costs with Huber Scrapers. Write for latest bulletin.

J. M. HUBER CORP.
P. O. Box 831
BORGER, TEXAS

HUBER
PARAFFIN SCRAPERS
SCRAPE AS THEY ROTATE AS THEY RECIPROCATE

LA.-ARK.

Barnsdall to Test Well In Bossier Parish

SHREVEPORT—Barnsdall Oil Co. 1 Ardis & Co., 27-22n-11w, Bossier Parish, cored from 9,945-10,019 ft., total depth, and prepared to run drill-stem tests. Report on the last core was shale, with no shows mentioned. Tests probably will cover the section from 9,739 ft., where cores found porous sand with distillate odor. Seven-inch casing has been set to 9,870 ft.

Caddo Parish.—Phillips Petroleum Co. 1 Ellerbe, 17-15n-12w, had total depth at 9,014 ft., in the Cotton Valley, and was testing. Peforations in the Cotton Valley at 8,120-32 ft. were squeezed after a drill-stem test recovered water and gas-cut mud. Operators then perforated from 4,450-70 ft., in the Rodessa. It was swabbed for 3 hours but would not flow. When shut in for 90 minutes, then opened, it flowed wash water and gas, estimated around 500,000 cu. ft. daily, through ¹⁄₄-in. choke. Flowing pressure was not reported.

Claiborne Parish.—Hunt Oil Co. 1 J. H. Owens, 19-23n-6w, was drilling below 9,153 ft. in the Cotton Valley. C. R. Schuster 1 Dance, 20-19n-6w, was in the Travis Peak at 7,230 ft. and drilling ahead. The 1 Dance is a Cotton Valley test.

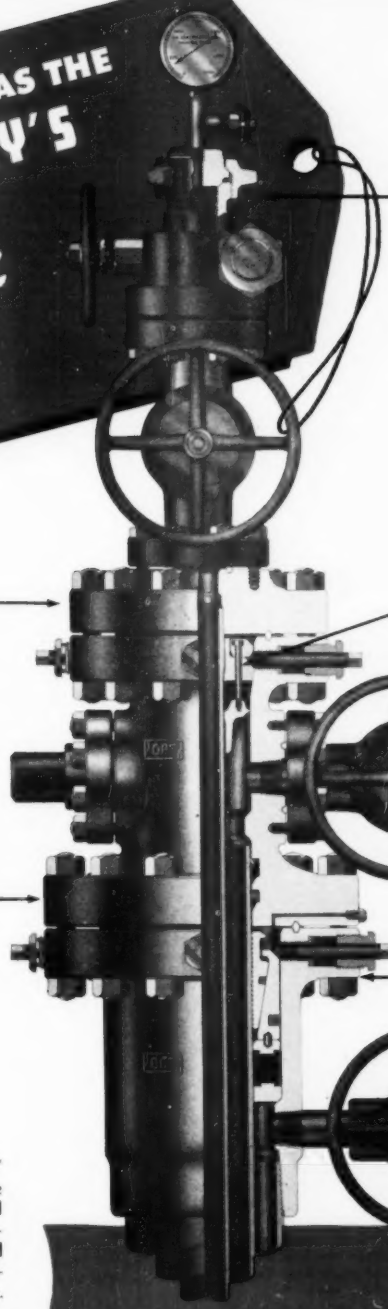
Sabine Parish.—Union Oil Co. of California 1 Long Bell, 35-7n-13w, which last week recovered light oil and gas shows on a drill-stem test of perforations at 5,740-48 ft., squeezed that set and reperforated from 5,740-46 ft. A drill-stem test then recovered 30 ft. of slightly gas-cut mud, after which the well was acidized with 2,000 gal. and flowed salt water.

Union Parish.—Carter Oil Co. 1 Hicks, 22-21n-3w, Cotton Valley test 6 miles east of the Lisbon field, was drilling in Travis Peak at 5,689 ft. Southwest Gas Producing Co. 1 Weldon, 24-21n-3w, 1½ miles southeast of Bernice, was drilling Travis Peak below 5,804 ft.

Arkansas.—McAlester Fuel Co. 1-A T. O. Giles, approximately NW NW 6-18s-18w, was drilling below 7,029 ft. in the Cotton Valley topped at 3,667 ft., by samples. It was scheduled to 8,000 ft.

Carter Oil Co. 1 T. F. Russell, SW NW

LABELED BY MANY AS THE OIL INDUSTRY'S MOST PRACTICAL WELLHEAD ASSEMBLY



JE-1 Flow Control . . . four pieces in one — quick change wing valve.

B-2 Bonnet.

WA-4 Tubing Hanger—economical, flexible, fast — no costly permanent investment in rams.

T-16-OU Tubing Head — dual seal, reduced pressure area. Low flange stress.

C-19 Casing Head — self-sealing, flexible, safe, fast installation.

With the flexible O-C-T "C-19" Casing Head as the foundation . . . the only casing head that meets every well completion condition with a single compact model . . . this O-C-T Wellhead and Tree Assembly has set a new standard for simplicity, for safety, for service.

This O-C-T Wellhead and Tree Assembly is the result of progressive O-C-T engineering and field service experience based on sound study, exhaustive laboratory work and field testing, by experience-qualified O-C-T Engineers.

Yes, it's O-C-T quality from top to bottom . . . labeled by many as the oil industry's most practical wellhead assembly. Write for complete engineering details.

ASSOCIATION OF WELL HEAD EQUIPMENT MANUFACTURERS CERTIFIED

Oil Center Tool Co.

P. O. Box 3091, Houston, Texas

Export Representatives: Venezuela, Colombia, Peru, and Ecuador—Barry & Hall, Apartado No. 304, Maracaibo, Venezuela—Sterling Arms—La Grand, Sutcliff & Gell, Ltd., Southall, Middlesex, England. Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston 1, Texas.

33-17s-16w, was drilling at 7,207 ft. in the Cotton Valley. No shows have been reported below the gas sand at 2,141-52 ft.

NORTH LOUISIANA WILDCAT FAILURES

Bossier Parish: Dem Oil Co. 1 N. W. Sentell, 30-22n-13w, dry, TD 3,165 ft.

Natchitoches Parish: The Texas Co. 1 L. E. Rochal, SE NE NE 10-6n-6w, dry, TD 5,856 ft., Wilcox 2,506 ft., Midway 5,652 ft., elev. 174 ft.

Ouachita Parish: The California Co. 1 Brown Paper Mill, NW NW 10-16n-3e, dry, TD 10,537 ft., Massive anhydrite 4,560-4,747 ft., James 5,315 ft., Travis Peak 6,000 ft., Cotton Valley 9,305 ft., D zone 9,671 ft., Bodcaw 9,770 ft., Vaughn 9,870 ft., elev. 106 ft.

ARKANSAS WILDCAT FAILURE

Ouachita County: Broseco Corp. 1 M. R. Linebarier, NE NE SE 22-13s-16w, dry, TD 3,168 ft. in Eagle Mills.

ILLINOIS

Gallatin County Wildcat Has Good Show

MATTOON.—Discovery of a new McClosky lime pool in Gallatin County, is indicated by results of a drill-stem test in V-T Drilling Co. and S. Gilpin 1 Wilson, SE NE SE 36-7s-9e. Test was made at 2,820-30 ft. Gas showed in 8 minutes after the testing tool was opened, and in pulling pipe, 355 ft. of oil and 75 ft. of oil-cut mud was recovered. Bottom-hole pressure was 400 psi. Casing is being run with bottom of the hole at 2,955 ft. Location is 2 miles northeast of North Inman pool and about 3 miles east of Cottonwood pool.

In the same county, George S. Engle 1 D. J. Maloney, SE SE SW 25-8s-9e, about a mile south of Inman pool, is being put on the pump after swabbing at the rate of about 15 bbl. of oil, plus about 100 bbl. of water, per day. Production is from the Tar Springs sand at 2,126-66 ft. Hole was drilled to 2,937 ft. and plugged back to 2,180 ft.

Dean F. Smith and associates are extending Mount Carmel West pool about a half mile to the north in their 1 Annis, SW NE NW 10-1s-13w, in which 70 ft. of clean oil and 115 ft. of oil-cut mud was recovered in a drill-stem test of the Biehl sand at 1,716-42 ft. Casing (5-in.) has been cemented 2 ft. in the sand. Total depth of the hole is 1,744 ft. The location also is about a mile east of South Friendsville pool.

About a mile south the shallow Casey (Pennsylvanian) sand pool opened last year by C. M. Faulkner in the SW SW NE 3-13n-13w, Edgar County, C. M. Hickman, trustee, 1 L. Brinkerhoff, NW NW NE 10-13n-13w, swabbed an estimated 25 bbl. of oil per day after shooting. Sand in the new well is at a total depth of 468 ft. The discovery well (1 R. Stoneburner) made an estimated 4 bbl. per day at a total depth of 457 ft. with sand at 424-30 ft.

Charles A. Baldwin 1 H. James, SW SW SW 27-6n-14w, 3 miles north of Ste. Marie pool, Jasper County, found promising oil showings in the Rosiclare at 2,667-75 ft. and 2,682-90 ft., and has run 5½-in. casing to total depth at 2,720 ft. to test.

Winn & Beck 1 Cheeley, NE NE SW 3-2n-4e, new pool opener in Marion County, has been put on the pump and is making about 35 bbl. per day from the McClosky lime with casing perforations at 2,738-48 ft. On swabbing tests previously reported, it made about 2 bbl. per hour. Total depth is 2,807 ft. The well is about 3 miles north east of Iuka pool and about 5 miles west of Xenia pool.

ILLINOIS WILDCAT FAILURES

Clay County: Ashland Oil & Refining Co. 1 E. Kessler, NW NW NW 3-4n-8e, dry, TD 3,103 ft.

Fayette County: Jax Oil Co. 1 Schwarm, NE SW SW 33-6n-3e, dry, TD 2,002 ft.

Jasper County: Farmals and Turnipseed 1 L. Kaufman, SE NW SW 25-6n-10e, dry, TD 2,871 ft.

Miracle and Steber 1 Ickmore, SE SE SE 16-6n-14w, dry, TD 2,681 ft.

Marion County: H. Luttrell 2-A Howell, SE NW SW 20-4n-3e, dry, TD 2,003 ft.

Shelby County: T. F. Myers 1 B. B. West, SE SE SE 5-10n-3e, dry, TD 1,890 ft.

EASTERN TEXAS

Wood County Discovery Prepares to Go on Pump

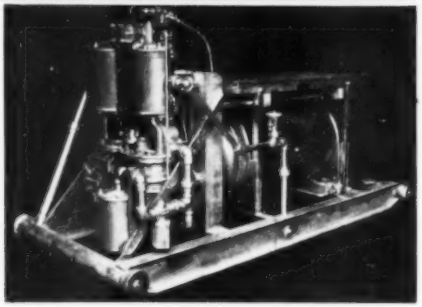
DALLAS.—Bobby Manziel 1 Maud Thompson, S. Yarbrough Survey, Wood County, sub-Clarksville discovery 2 miles northwest of Mineola, was moving in pumping equipment for completion after swabbing from 30-40 bbl. of black crude an hour. Gravity was estimated at 30°. There was no formation water with the oil and observers have estimated a daily potential of 250 bbl. on the pump. Casing was perforated at 4,692-4,704 and 4,712-25 ft.

Location of the new well is about 6 miles southwest of Merigale-Paul (sub-Clarksville) field, and may be a continuation of that northeast-southwest fault, according to some reports. White-Webb Drilling Co. had the rig skidded one location east and north for a second test, on the W. D. Cain tract, of the same survey.

Two miles west and south of the 1 Thompson, R. R. Jackson and J. M. DeuPree have made location for a sub-Clarksville test on the northeast corner of the Joe

(Continued on page 179)

Steam Driven AIR COMPRESSOR UNITS



Designed specifically for oil field use, Kinzbach Air Compressors meet requirements of steam drilling rigs for pneumatic operation of air brakes, slips, tongs, catheads and other auxiliary equipment.

They're available in several sizes and are furnished complete, ready for immediate use, with air reservoir, after-cooler, safety valves, automatic governor and all other required fittings.

KINZBACH TOOL CO., INC.
P. O. Box 277 Houston, Texas
Export Office: 74 Trinity Place, New York, N. Y.

TECHNICAL REFERENCE MANUALS . . .

As a service to its subscribers, the Journal offers the following technical manuals for sale in limited quantities. To facilitate handling, enclose the address label from your Journal.

149 Units of Refiner's Notebook (W. L. Nelson)	$1.50
Modern Rotary Drilling (J. Zaba)	1.00
Engineering Fundamentals—Advanced Reservoir Engr. (John C. Calhoun)	1.00
Engineering Fundamentals in Modern Drilling (Glenn Stearns)	1.00
Reference Manual on Electric Logging (S. J. Pirson & others)	1.00
Modern Refining Processes (George Amistead, Jr.)	1.00
Oil Well Pumping Methods (J. Zaba)	1.00
Manual of Fluid Flow (Paul Buthod & B. W. Whiteley)	.50
Manual on Heat Transfer (Paul Buthod & B. W. Whiteley)	.50

Mail orders to Reader Service Department

THE OIL AND GAS JOURNAL
TULSA OKLAHOMA

N. CENTRAL TEXAS

Strawn Sand Production Found Near Woodbine Field

WICHITA FALLS.—Strawn sand production 1½ miles south of Woodbine field in Cooke County, with dry holes between, was in prospect at A. R. Dillard 1 Nancy Mitchell, G. de los Santos Survey. The well drilled sand showing oil from 4,021-28 ft., then recovered 400 ft. of clean oil and 50 ft. of oil-cut drilling mud on a 30-minute drill-stem test of the section. Operators set casing at 4,020 ft. for completion tests.

Archer County.—New Strawn sand pay in an old shallow area 3½ miles west of Archer City was reported at D. H. Bolin 15-B W. C. Thomas, N. Thomas Survey. The well was said to have swabbed at the rate of 100 bbl. of oil a day from 3,812-26 ft. Location is about 1 mile west of Featherstone and others' 1 W. C. Thomas, northwest of Archer City, which had pay in the Strawn at 3,718-22 ft.

Four miles southeast of Archer City, Carnation Petroleum Co. 1 J. D. Carpenter, Lot 89, Block 4, Clark & Plumb Survey, had dry sand from 3,898-3,916 ft., and was drilling ahead at 3,920 ft.

Approximately 1 mile east of the Medders-Hancock field, W. J. & J. J. Moran 1 McGregor Ranch, 4-1-H&TC, kicked off and made a natural flow into pits after plug was drilled on casing set at 3,870 ft. The Strawn sand has shown for good production between 3,872-81 ft.

Baylor County.—Six miles southeast of Bomarton, Cox Drilling Co. 1 Portwood, W. R. Dickerson Survey, had good shows of oil and gas while drilling the Mississippi lime, but a drill-stem test from 5,466-5,516 ft., open 30 minutes, recovered 40 ft. of lightly gas-cut mud with a taste of oil. Bottom-hole pressure was 1,150 psi. in 20 minutes.

Jack County.—Mid-Continent Petroleum Corp. 1 C. E. Campsey, M. W. Thompson Survey, southeast outpost to the Post Oak field, recovered 675 ft. of gas-cut mud on a 2-hour drill-stem test of the Bend conglomerate at 5,809-48 ft. Drilling continued below 5,974 ft. in shale.

J. J. Lynn 1 Willcocksin, M. Aiken Survey, 4 miles northeast of Jacksboro, was drilling below 5,790 ft.

Russell Maguire made location for 1 W. M. Eason, 1,843 ft. from south and 467 ft. from west lines of the northwest quarter, WC Survey, A-2260. The semi-wildcat is 1½ miles east of the Steed-Worsham field and about the same distance south of the field's northeastern edge wells.

Nolan County.—Completion at Iowa-Payne Oil Co. 1 N. L. McLeod, 44-19-T&P, 2 miles southwest of Trent, has been delayed by attempts of operators to shut off water from the Ellenburger. Plastic plug was run from 5,447-57 ft. and bailing and swabbing was under way to test the seal. The well has shown for production from the Strawn at 5,126-54 ft. and 5,397-5,413 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Archer County: Wayne H. Hammon 1-C Fassett & Tuttle, Blk. 37, Cherokee CSL, 4 mi. SE Wichita Falls, flowed 152½ bbl. 43°-gravity oil in 4 hr., 24/64-in. choke, Caddo 5,305-18 ft., TD, CP 800-500 psi., TP 600-250 psi., GOR 400 cu. ft.

Throckmorton County: Woodley Petroleum Co. 1 Henry S. Bryson, Sec. 911, TE&L Sur., 3 mi. SW Woodson, flowed 151½ bbl. oil a day, 10/64-in. choke, Mississippian 4,599-4,699 ft., TD, TP 675 psi., CP 1,000 psi., GOR 675 cu. ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: Akin & Dimock 1 J. S. Eubanks, J. M. Swisher Sur., A-396, 8 mi. NE Megargel, dry, TD 1,456 ft., lime with oil show 1,318 ft.

L. T. Burns 1 A. B. Edwards, Blk. 47, Madison CSL, 4 mi. NW Scotland, dry, TD 4,902 ft.

Consolidated Oil Co. 2 Cordelia Knight, Sec. 1, SPRR Sur., 2 mi. W Holliday, dry, TD 1,836 ft.

K. R. March 2 J. Darilek, Sec. 2410, TE&L Sur., 2 mi. S Megargel, dry, TD 1,455 ft., Gunsight lime 1,426-27 ft.

Southern Petroleum Explorations Co. et al 1 Grace Bell, Blk. 89, Jefferson CSL, 5 mi. SE Archer City, dry, TD 4,916 ft., Gunsight lime 1,075 ft., KMA lime 3,284 ft., Caddo 4,775 ft., DST's recovered oil-cut mud, elev. 1,031 ft.

Baylor County: Humble Oil & Refining Co. 1 Henry Peek, John Barclay Sur., 6 mi. SE Seymour, dry, TD 2,973 ft.

M. L. Richards 1 C. H. Taylor, Sec. 10, H&TC Sur., 6 mi. SW Rendham, dry, TD 2,853 ft.

Brown County: H. E. Davenport 1 Joe Weedon, J. B. Foreman Sur., 10 mi. NW Brownwood, dry, TD 1,690 ft., Caddo 1,653 ft.

C. L. Norsworthy, Jr., 1 A. O. Angel, 15-111-BBB&C, 5 mi. SW Rising Star, dry, TD 2,987 ft., Caddo 2,535 ft., Marble Falls 2,926 ft., elev. 1,694 ft.

Worth Thompson 2 E. F. George, J. M. Cross Sur., 6½ mi. NW Bangs, dry, TD 1,309 ft.

Callahan County: John Wrather 1 Mrs. J. A. Heyser, T. B. Owens Sur., 7 mi. S Putman, dry, TD 1,857 ft.

Clay County: Barnsdall Oil Co. 1 H. Zachary, Felix Houston Sur., 9 mi. N Ringgold, dry, TD 5,787 ft., Caddo 5,551 ft., Ellenburger 5,617 ft.

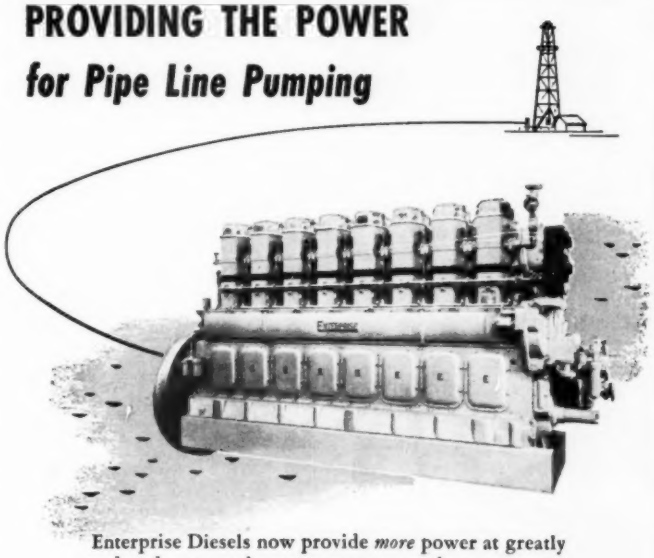
Consolidated Oil Co. et al 1 J. H. Windle, 5 mi. NW Joy, dry, TD 5,385 ft., Vogtsberger sand 4,487 ft., DST recovered oil-cut mud.

J. L. Storey 1 A. B. Edwards, Jr., Blk. 22, Halsell Subd. 2, 8 mi. SW Henrietta, dry, TD 4,961 ft.

Cooke County: E. L. Leslie 1 Mrs. Jennie

(Continued on page 179)

PROVIDING THE POWER
for Pipe Line Pumping



Enterprise Diesels now provide *more* power at greatly reduced cost per horsepower to meet the most exacting demands required in pumping service. Substantial economies are offered through 1) simplicity of connection and control, 2) high torque at all speeds, and 3) elimination of transmission losses. They are designed and built to withstand heavy punishment from excessive pumping loads. Smooth, even, vibration-free operation is characteristic of this precision equipment.

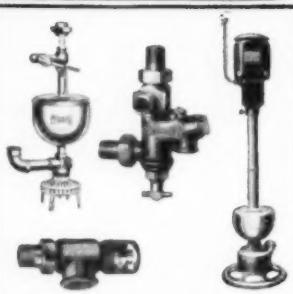
Whatever your pumping power requirements, check Enterprise Diesels first. You'll find them flexible to your needs, using Diesel oil, modified crude oil, natural gas or dual-fuel. Normally aspirated or turbo-charged up to 1800 HP per unit. Write or call for information on your particular power problems.

Builders of Heavy Duty Engines and Equipment Since 1886

ENTERPRISE *Diesels*

ENTERPRISE ENGINE & FOUNDRY CO.
18th and Florida Streets • San Francisco 10, California
With Branch Offices in Houston and Fort Worth Serving the Oil Industry

PENBERTHY
QUALITY
PRODUCTS



Penberthy injectors—ejectors—automatic electric and water (or steam) operated sump pumps are all widely used throughout the oil industry because they have always been dependable under the most severe service conditions.
All are of rugged construction and made by an organization with 59 years experience in the manufacture of highest quality products.

PENBERTHY INJECTOR CO.
DETROIT 2, MICH. Canadian Plant WINDSOR, ONTARIO

Martin

screw-lift
GATE...

A low cost, full-opening, low-pressure gate with rising screw. Used by oil companies for general drainage and clean-out work. Cast-iron body with angle-iron frame. Sizes 8" to 36". Has positive shut-off action, is ruggedly built, easy to operate and simple to service. Write for Type "L" Bulletin and prices.

Martin
IRON WORKS
P.O. Box 2857—Terminal Annex
Los Angeles 54, Calif.
Since 1900

Plant and General Offices, 1222 E. 28th Street

CALIFORNIA

Humble Gets Its First California Discovery

LOS ANGELES—Humble Oil & Refining Co. has made an oil discovery in the Lion Mountain area of Ventura County, its first in California since it undertook an exploratory drilling campaign in this state some 6 months ago. The company's 1 E. Hammond, 18-3n-22w, 1½ miles southeast of Ojai, flowed by heads through a ¼-in. choke at the rate of 70 bbl. a day of 23°-gravity oil from sand of Eocene age. The well was drilled to 4,350 ft. and plugged back to 4,048 ft., with interval at 3,990-4,035 ft. perforated with 270 shots. Barring a flowing well, the operator appears to be assured of a good pumper. This is the seventh wildcat drilled by Humble in the state since last December, although the company joined with British-American Oil Producing Co. in one test prior to that date which was unsuccessful.

Honolulu Oil Corp. is credited with a new pool discovery in the Devil's Den area of Kern County. Operator has cemented 7-in. casing at 1,600 ft. in the Wagonwheel formation in its 67 Alferitz, 14-25s-18e, following recovery of 18°-gravity oil on a bailing test, and will put the well on the pump.

Middle Dome Corp.'s Eocene deep test 30V-52, 30-23s-19e, on the Middle Dome of Kettleman Hills, Kern County, flowed 510 bbl. of oil and about an equivalent quantity of water through ¼-in. choke on a formation test of interval from 12,030 ft. to bottom at 12,286 ft. Operator has run water witch and determined that the water entry is between 12,225-73 ft. Top of the sand is approximately 12,064 ft. The well will be plugged back in an attempt to solve the water problem and retested.

Chanslor-Canfield Midway Oil Co. had oil showings on the ditch at its 1 Santos, 32-28s-20e, 1½ miles southwest of Bacon Hills production in Kern County. Total depth is 1,688 ft.

Atlantic Oil Co. has encountered a heavy volume of gas in its 77-25T, 25-19s-14e, Fresno County. This is a northwesterly extension test of West Coalinga field and the operator's objective is oil or gas production in the Cretaceous. The well was spudded in Kreyenhagen shale, entered the upper Cretaceous (Moreno shale) at 700 ft. and is bottomed at approximately 5,400 ft. in Panoche beds of middle Cretaceous. This is understood to be the first well to penetrate an appreciable thickness of Cretaceous strata in this area. The only commercial production of oil from the Cretaceous in California was found in Oil City field several miles to the east many years ago. Natural gas, however, is found in this formation in a number of fields in the northern Sacramento Valley. Oil possibilities of the zone continue to be investigated from time to time and Shell Oil Co., Inc., is presently drilling such a test in the Logan Ridge area of Glenn County, which is now below 10,100 ft. and believed to be close to its objective.

Richfield Oil Corp.'s 11 Hibbard, 36-10n-27w, easterly offset to its 1 Homan, South Cuyama discovery well, topped the Dibblee oil zone at 4,310 ft. and has set casing. Superior Oil Co.'s northeasterly offset, 18 Buzard et al, 25-10n-27w, is also in the sand, which was logged 95 ft. lower in this well than it was in Richfield's discovery. Superior has staked a location for 28 Heath 660 ft. east of its Buzard well.

Wilshire Oil Co.'s 22 Cantua in the Cantua Creek area of Fresno County, 10-17s-15e, is running a formation test on Temblor showings logged in the interval 6,543-62 ft. Oil sands have been encountered in both the Temblor and the Domengine formations in a series of wildcats drilled in this area since 1933, mostly by Western Gulf Oil Co., but no commercial production has been obtained to date.

CALIFORNIA WILDCAT FAILURES

Kern County, Mount Poso area: Fred Allen 1 Woody, 12-27s-28e, dry, elev. 1,425 ft., granite 1,800 ft., TD 1,840 ft.

Jasmine area: The Hancock Oil Co. of California 1 Marquis, 31-25s-27e, dry, elev. 683 ft., TD 4,494 ft.

McKittrick area: Independent Exploration Co. 1 Williams, 2-30s-21e, dry, elev. 940 ft., TD 1,536 ft.

Tejon Hills area: Henry Lubkins Associates 1-62, 33-12n-18w, dry, elev. 868 ft., TD 1,030 ft.

On Mud Lines, Steam Lines
Oil and Gas Lines . . . It's sure!

RECTORSEAL #1

Whether you are working on mud lines, steam lines, water lines or oil and gas lines on your rig, RECTORSEAL #1 can make every connection leak-proof, safe and sure! 10 years of service and industry acceptance means it's got to be good!

It's easy to apply . . . a little goes a long way. It's dependable leak prevention for life of the connection.

Ask your supply store for Rectorseal #1 by name.

Write: RECTORSEAL, Dept. D, 2215 Commerce St., Houston 2, Texas.

RECTORSEAL
Manufactured by
RECTOR WELL EQUIPMENT CO., INC.
Fort Worth, Texas
MAKING THE OIL INDUSTRY SAFER

Dragon Cups will pump your wells longer — will save pulling jobs.

•

GET THEM AT YOUR SUPPLY STORE

DRAGON MFG. CO.
Marietta, Ohio

D. C. Mackey 1 White Oak, 12-11n-18e, dry elev. 845 ft., TD 260 ft.

Famosa area: McCarthy Oil & Gas Co. 1 Bergman Trust, 2-27s-26e, dry, elev. 629 ft., TD 6,703 ft.

San Luis Obispo County, Cuyama Valley area: The Texas Co. 1 Edgar (NCT-1) 12-32s-19e, dry, elev. 2,450 ft., TD 6,468 ft.

Riverside County, Corona area: Elkhorn Petroleum Co. 1 Heinlein, 28-4s-6w, dry, elev. unknown, TD 950 ft.

OHIO, KENTUCKY

Exploratory Campaign in Ohio Declared Failure

COLUMBUS.—An extensive exploratory campaign conducted by the East Ohio Gas Co., M. B. Belden, et al in an area from the northern part of Stark County to the middle of Carroll County, is practically completed and has been a total failure. Thick deposits of Clinton sand were found in all the tests, but few shows of either oil or gas were found.

M. B. Belden 1 Howard Community, Section 13, extended the gas pool in southern Bethlehem Township, Stark County, nearly a mile to the northeast. Red Clinton at 4,461-97 ft. made 160,000 cu. ft., and white sand at 4,497-4,516 ft. made 501,000 cu. ft. When shut in on the casing 2 hours after shot, the gage was 600,000 cu. ft.

Frank Brendel's attempt to extend to the east the gas pool in southwestern Lawrence Township, Tuscarawas County, resulted in only a light well. Clinton at 4,696-4,723 ft. made 320,000 cu. ft. natural and 340,000 cu. ft. when shut in after shot.

The Chartiers Co. moved ½ mile northwest of its small wildcat producer for another test of large block of leases. The location will be on the Muskingum College tract in Section 19.

Ashland County led in new locations reported with 5 out of a total of 18. Twenty-four wells were completed with Cambridge and Lancaster having six each.

OHIO WILDCAT FAILURES

Carroll County, Rose Township: East Ohio Gas Co. 1 C. R. Aston, Sec. 26, Clinton 5,208-93 ft., TD 5,403 ft.

Holmes County, Richland Township: Lydic & Shafer 1 Pipes, Sec. 13, Clinton 3,360-65, 3,387-88 ft., TD 3,434 ft.

WESTERN KENTUCKY

OWENSBORO.—The Ohio County prospective producer, J. M. Murphy, George Wakefield, and T. R. McInturff 1 R. M. Hunt, 18-N-31, will be put on pump to test the Jackson sand at 971-85 ft. The pay has had a 20-qt. shot and production is estimated at about 40 to 50 bbl. per day. The new well is near Pleasant Ridge and Bells Run pools in the western part of the county.

Ashland Oil & Refining Co. and Basin Drilling Co. have another producer in North Euterpe pool in the eastern part of Henderson County. The well, 2 George R. Crafton, NW NW NE 10-O-25, was completed in the Hardinsburg at 1,664-1,700 ft. with an initial production of 60 bbl. per day on pump.

In Daviess County, J. W. Tuttle et al 1 Shadwick, C E½ SE 8-Q-31, is reported to be fishing for a lost casing joint after showing for a good well in the Cypress at 1,002-16 ft. The pay was shot with 40 qt. and the hole filled with oil.

Sun Oil Co. has completed 1 A. B. Robertson, 22-O-18, Union County, with an initial production of 48 bbl. per day from the Cypress at 2,235-58 ft. The new well is southwest of Spring Grove pool and about 4 miles west of South Morganfield pool.

EASTERN KENTUCKY

ASHLAND.—In Breathitt County, 1-N-75, Diederich & Ware topped Corniferous lime at 2,052 ft. at their 1 Boone Coal & Timber.

(Continued on page 179)

PAGE FENCE—Since 1883

• AMERICA'S FIRST WIRE FENCE •

Thinking about a Fence?

● You know that protection of persons and property is good judgment—and you intend to do something about it. To know *what* to do, write to Page Fence Association for illustrated facts. Note the several styles of Page Chain Link Fence and Gates. Then talk with our nearest association member. He will help you pick the *right* fence, made of the right metal in the right way, and will explain his right method of fence erecting. He is an experienced local fence specialist offering more than a product—a complete and reliable fence service. His name and address will be sent with the illustrated fence facts we offer you.

Write to PAGE FENCE ASSOCIATION in Monessen, Pa., Atlanta, Bridgeport, Chicago, Denver, Detroit, Los Angeles, Philadelphia, Pittsburgh, New York or San Francisco.

PRODUCT OF PAGE STEEL & WIRE DIVISION OF AMERICAN CHAIN & CABLE COMPANY, INC.

KELCO Safety CATHEADS

KelCo SPINNING LINE and BREAKOUT CATHEADS

KelCo Model 16-LH Non-Fouling Cathead

FOR DEEPEST DRILLING WITH GREATEST SAFETY

In Use in All Domestic and Foreign Fields

AVAILABLE THROUGH YOUR FAVORITE SUPPLY STORE

Representatives in All Fields

Be Safety Wise — KelCo-Ize

KELCO BEN F. KELLEY CO., Inc.
TULSA, OKLAHOMA

Export Representative: E. L. Carter, 1940 R.C.A. Bldg., Rockefeller Plaza, New York, N. Y.

PERMIAN BASIN

Dollar Hide Outpost to Be Plugged Back to Devonian

MIDLAND.—Cities Service Oil Co. 1-E Cowden, north outpost to Dollar Hide field of Andrews County, encountered additional water in the Silurian and observers believed it would be plugged back to complete from the Devonian.

Following the first acid treatment of 1,000 gal. through perforations at 8,645-99 ft., swabbing recovered mud and oil. A second treatment of 3,000 gal. resulted in a recovery of 286 bbl. of fluid in 29 hours. At the start of the test, fluid recovered was cut 10 per cent with water, which increased to 50 per cent water at the end of the test.

Magnolia Petroleum Co. 18-B Cowden, southeast outpost to Dollar Hide, prepared to run production tests just above the water table in the Silurian. Plug on casing was drilled to 11,130 ft., electrical surveys run and casing jet-perforated 4 per foot from 11,056-062 ft.

Upton County.—Humble Oil & Refining Co. 1 Ralph Pembrook, Block X, C. C. DeWitt Survey, 6 miles north of the Benedum field, recovered 115 ft. of heavily oil and gas-cut mud, estimated to be 25 per cent oil, on a 2-hour drill-stem test in the middle Permian at 6,635-6,700 ft. Flowing pressure was 155 to 400 psi., and shut-in pressure was 1,700 psi. in 15 minutes. Operators continued drilling below 6,810 ft.

Benedum completions included Slick-Urschel Oil Co. 1-B J. S. Elliott, NW SW 46-Y-CCSD&RGNG, $^{3}/_{8}$ mile northeast of Ellenburger production. The 1-B Elliott completed for 532 bbl. of 60°-gravity oil a day, without acid, from open hole at 11,440-525 ft. The flow was through $^{1}/_{2}$-in. choke; flowing pressure on tubing was 750 psi. and gas-oil ratio was 3,850 cu. ft. West of Ellenburger production on the south end of the field Plymouth Oil Co. 1-9 H. F. Neal, SE NE 9-4½-GC&SF, completed for a flowing potential of 80 bbl. of 52°-gravity oil. Flowing pressure was 375 psi. with 5/16-in. choke. Top of pay was 11,488 ft.

Runnels County.—A new and deeper pay was indicated in the North Winters field at George W. Strake 1 Mattie Smith, 990 ft. east and 330 ft. north of the discovery well. After acidizing with 3,000 gal., around total depth at 3,108 ft., it swabbed at the rate of 5 bbl. of oil an hour, cut with mud and acid water, and no formation water. Operators believed the new zone to be the basal Gunsight or the top of the Bunger lime. The discovery is producing from the Gunsight sand at 2,511-28 ft. Further tests of the new well were to be made when pumping equipment was installed.

Tom Green County.—M. E. Davis and Hiawatha Oil & Gas Co. 1 W. C. Jones, 190-11-SP, 3 miles west of Strawn production in the Susan Peak field, recovered 300 ft. of oil and gas-cut mud on a 45-minute drill-stem test in the Canyon lime at 4,408-4,501 ft. A second test from packer at 4,586 ft., to 4,613 ft., total depth, recovered 245 ft. of drilling mud with no shows. Drilling continued below 4,690 ft. in shale. Tentative top on the Canyon was 4,362 ft.

Ector County.—Forest Development Corp. 1 TXL-Phillips, 25-45-T1S-T&P, 3 miles west of the Goldsmith 5,600-ft. field, was running drill-stem tests in the upper Clear Fork. A test from 5,753-5,802 ft. produced gas and 228 ft. of oil and gas-cut mud. From 5,801-50 ft., recovery was 410 ft. of fluid, the top 280 ft. being heavily cut with gas and the bottom 130 ft. slightly cut with oil. Time on the two tests was not reported. From 5,849-97 ft., open 95 minutes, recovery was 45 ft. of drilling mud. Operators drilled ahead to 5,947 ft. and prepared another test.

Gaines County.—On the southwest flank of the Cedar Lake field, (San Andres 4,760 ft.), Stanolind Oil & Gas Co. 15 American Warehouse Co. 5-H-D&W, plugged back from 13,185 ft., new total depth in the Ellenburger, where sulfur water was encountered, to 12,314 ft., in the Devonian. Plans were to drill out to 12,350 ft. Previously, a 2-hour drill-stem test from 12,217-350 ft. recovered oil and gas-cut water blanket, 180 ft. of clean oil and 720 ft. of heavily oil and gas-cut mud.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCAT

Crockett County: Fred Turner 1 Shannon estate, NW NW SW Quarter, League 3, Archer CSL, 9 mi. E Iraan, 10,000,000 cu. ft. of gas, 2,125-50 ft., TD.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Coke County: Sand Valley Oil Co. 1 F. C. Rawlings, C. F. Otto Sur., 3 mi. NW Water Valley, dry, TD 1,406 ft.

Union Oil Co. of California 1 Jack Frost, NE SE 269-A1-H&TC, 4 mi. W Blackwell, dry, TD 7,061 ft., tops not reported.

Crane County: George Kidd 1 McClintic Bros., SW of Grayburg field, W of McElroy field, 210-F-CCSD&RGNG, dry, TD 3,327 ft.

Crockett County: George Bean 1 George Bean, NE NW 27-UV-GC&SF, 11 mi. NW Ozona, dry, TD 1,489 ft.

Sun Oil Co. 1 Halff-Bivins estate, 53-L-I&GN, 4½ mi. W Clara Couch field, dry, TD 2,108 ft.

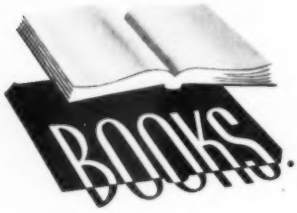
Culberson County: Pure Oil Co. 1 Eloise Hunter, 34-66-T&P, 6 mi. NW Guadalupe Pass, TD 6,650 ft., Pennsylvanian 2,521 ft., Mississippian 4,100 ft., Devonian 5,275 ft., Silurian 5,333 ft., Ellenburger 6,600 ft., elev. 5,308 ft.

Garza County: George R. Brown 1 W. J. Long, Sec. 1305, BS&F Sur., 12 mi. NW Post, dry, TD 3,685 ft.

Plymouth Oil Co. 1 V. B. Sims, 8-2-T&NO, 8 mi. S Garza field, dry, TD 8,462 ft., Ellenburger 8,390 ft., elev. 2,491 ft.

Pecos County: M. R. McManigle 1 Lowery & Wilson, 33-Z-TCRR, 12 mi. NW Iraan, dry, TD 1,809 ft., San Andres 1,780 ft.

(Continued on page 179)



. . . for the Oil Man

GEOPHYSICAL CASE HISTORIES—Vol. I, 1949

By Society of Exploration Geophysicists

Of particular importance to oil executives or potential executives. First volume of a series providing material by which geophysical surveys can be judged from later developments and thus aid in the evaluation of other geophysical work; a collection of 60 papers on geophysical observations made under a wide variety of field circumstances. Classified by producing areas for quick reference. Complete index to maps and figures. 7x10, 680 pages, illustrated. **$7.00**

PRACTICAL ACCOUNTING FOR OIL PRODUCERS

By Robert M. Pitcher

A book of boiled-down, practical methods used by experienced accountants. Tested procedures for the adequate allocation and recording of investment, income, and expense so necessary to the operation of a crude oil producer. Lists and explains actual records and typical problems commonly found in oil production accounting . . . easy to understand by use of graphic illustrations and specimen voucher entries. Representative problems, worked out step by step, supply you with quick solutions. 656 pages—illustrated—1947. (Revised) **$15.00**

GEOPHYSICAL PROSPECTING FOR OIL

By L. L. Nettleton

This book provides in a single volume a connected presentation of the principles and practices of modern oil prospecting by geophysical methods. Particular care has been taken to explain clearly the necessary procedures for reducing field measurements to usable form. 6x9, 444 pages illustrated—1940 **$5.50**

AMERICAN OIL OPERATIONS ABROAD

By Leonard M. Fanning

Provides readers with a new insight into the international oil situation. Tells how Americans ranged the earth, from neighboring lands to distant corners in search of oil and reveals the scope of American interests and activities in each country. Depicts the romance and significance of oil field development—oil fields that grew into cities, the training of nationals to become drillers and technicians, and the effect on living standards of nations. 270 pages. 265 illustrated charts, and 31 tables—5½x8—1947 **$5.00**

Mail Order to READER SERVICE DEPARTMENT

THE OIL AND GAS JOURNAL

Tulsa, Oklahoma

April Completions Gain 4.3 Per Cent Over Same Month Last Year

by Polly DeArmond

THE number of completions in April totaled 3,083, a gain of 129 wells, or 4.3 per cent, over April of 1948, and total footage of 11,267,200 ft. was up 1,051,646 ft., or 10.3 per cent. By depth classifications, the number of wells drilled over 10,000 ft. increased 20.9 per cent, the group between 7,500-10,000 ft. was up 21.3 per cent, completions in the 5,000-7,500-ft. range gained 19.3 per cent, the 2,500-5,000-ft. class reported an increase of 7.2 per cent, and the number of shallow wells (drilled less than 2,500 ft.) decreased 6 per cent.

The most notable increases were recorded in the Rocky Mountain region which was up 53.9 per cent in completions and slightly more than 85 per cent in footage over the same month of last year. The North Central section, including Ohio, Indiana, Kentucky, Illinois, and Michigan, reported a 32.9 per cent increase in wells with a corresponding 31.8 per cent gain in depth drilled. The Mid-Continent division of Oklahoma, Kansas, Nebraska, and Missouri showed gains of 23.3 per cent in completions and 25.7 per cent in footage. During the month, operators in Texas and New Mexico drilled 6.6 per cent more wells and 12.7 per cent more footage than in April 1948.

The greatest decreases in the April-vs.-April comparison occurred in the Eastern area (New York, Pennsylvania, and West Virginia) which was down 31.1 per cent in wells and 34.2 per cent in footage. The Southern states of Arkansas, Louisiana, Mississippi, Alabama, Florida, and Tennessee declined 18.3 per cent in completions and 5.9 per cent in total depth. The Pacific Coast showed a decrease of 15.3 per cent in wells and fell 11.7 per cent in footage.

April vs. March

Comparisons of the month with the previous month this year indicates that the high rate of all completions so far this year continued in April and that footage dropped a negligible amount. The following areas recorded gains in both classifications: the North Central section, up 12 per cent in wells and 9.6 per cent in footage; the Mid-Continent district, up 24.5 per cent in completions and 21.3 per cent in total depth; and the Rocky Mountain region, up 40.6 per cent in wells and 46.3 per cent in footage. The Eastern area showed a 6.8 per cent rise in completions while footage remained about the same as for March, and the Pacific Coast had a 4.2 per cent increase in number of new wells drilled with a 7.3 per cent loss in total footage.

Considering operations on a 4-month basis, total wells completed in 1949 average a bit more than 3 per cent over the same period last year, and footage was up more than 8 per cent. The two major contributors to these over-all gains were the North Central section, with a 12.6 per cent gain in wells and a 10.7 per cent increase in footage, and the Texas-New Mexico area, reporting a gain of 14.3 per cent in completions with an additional 15 per cent total footage. The Rocky Mountain region was up 5.4 per cent in wells and 5.3 per cent in footage drilled, and the Mid-Continent district increased 1.6 per cent in completions and 5.5 per cent in total depth.

SUMMARY OF COMPLETIONS, APRIL 1949

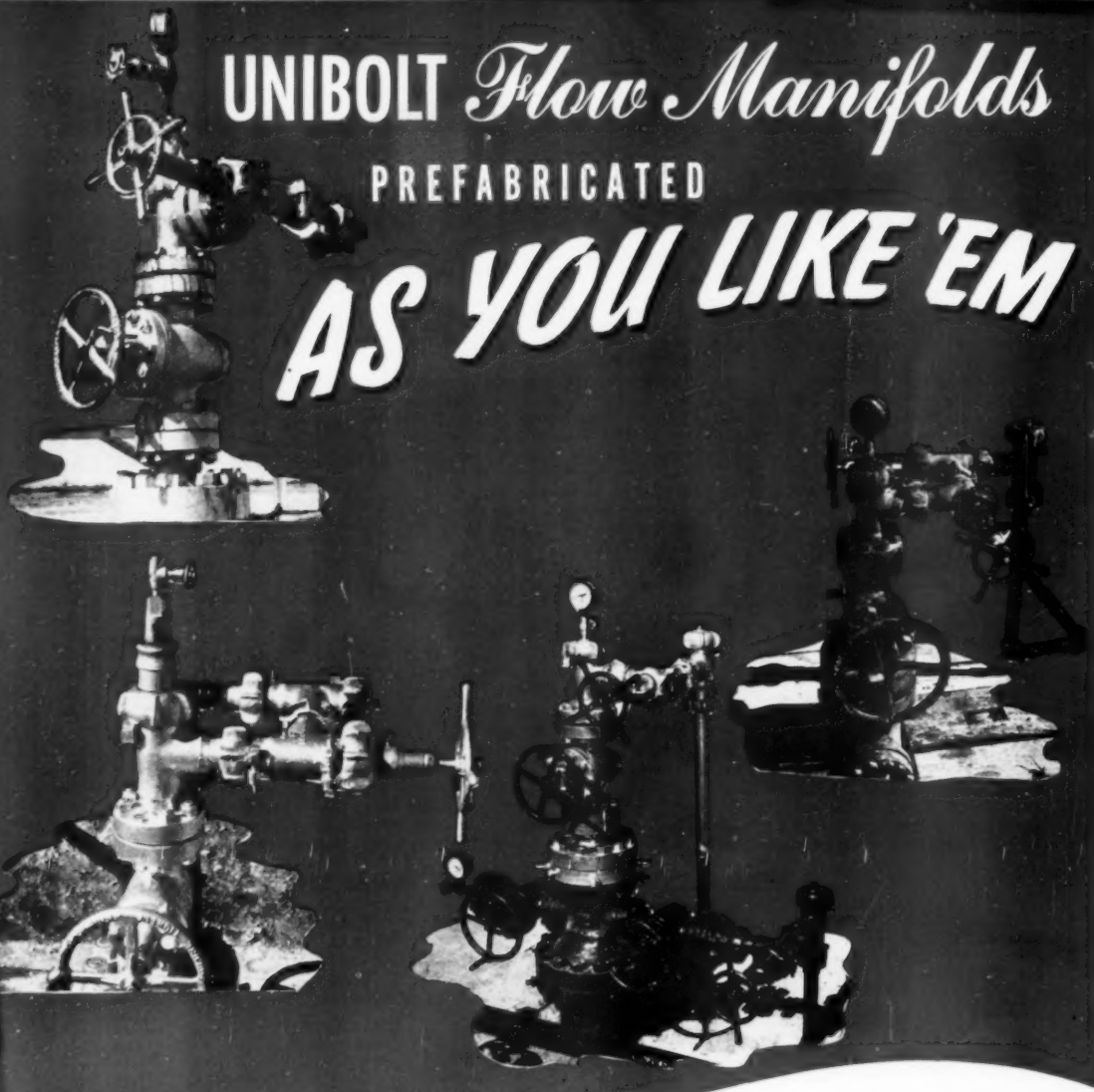
	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	69	35	0	34	69	0	0	0	0	0	99,046	134
Pennsylvania	191	84	14	93	184	7	0	0	0	0	274,341	257
West Virginia	38	1	29	8	10	24	3	1	0	0	127,304	162
Ohio	82	24	24	34	43	39	0	0	0	0	179,894	126
Indiana	89	43	1	45	67	22	0	0	0	0	181,242	123
Kentucky	74	31	21	22	55	18	1	0	0	0	143,031	46
Illinois	183	107	0	76	59	124	0	0	0	0	448,764	301
Michigan	76	29	0	47	53	23	0	0	0	0	176,518	99
Kansas	238	137	8	93	33	204	1	0	0	0	773,764	433
Neb., Mo., Iowa	9	0	2	7	6	1	2	0	0	0	22,796	6
Oklahoma	408	239	31	138	122	214	60	2	9	1	1,418,321	663
Texas	1,051	620	81	350	252	412	247	107	31	2	4,740,069	1,377
North	219	115	1	103	119	69	31	0	0	0	618,790	189
West Central	143	69	7	67	44	86	13	0	0	0	455,211	209
West	222	190	1	31	29	85	64	26	16	2	1,236,312	412
Panhandle	70	37	30	3	3	66	0	1	0	0	221,891	97
Eastern	59	30	5	24	11	26	14	7	1	0	274,868	81
Gulf Coast	163	97	16	50	2	45	60	46	10	0	1,059,248	224
Southwest	175	82	21	72	44	35	65	27	4	0	873,749	165
Louisiana	139	92	10	37	48	17	20	25	19	10	816,317	260
Northern	71	48	8	15	46	6	11	2	6	0	248,592	80
Southern	68	44	2	22	2	11	9	23	13	10	567,725	180
Arkansas	28	17	1	10	6	15	3	4	0	0	112,255	40
Mississippi	33	16	0	17	0	5	17	5	6	0	231,678	34
Ala., Ga., Fla.	5	0	0	5	1	4	0	0	0	0	17,257	6
Tennessee	5	1	0	4	5	0	0	0	0	0	4,981	9
Montana	24	15	1	8	7	12	3	1	1	0	87,808	96
Wyoming	62	34	2	26	5	27	15	6	8	1	309,603	164
Colorado-Utah	11	5	0	6	1	4	3	2	0	1	64,387	59
New Mexico	46	25	9	12	8	21	10	4	2	1	219,203	133
California	222	171	1	50	86	80	36	14	4	2	818,621	277
Total April 1949	3,083	†1,726	235	*1,122	1,120	1,273	421	171	80	18	11,267,200	‡4,805
Total March 1949	3,076	1,771	211	1,094	1,064	1,271	429	208	88	16	11,618,579	4,767
Total April 1948	2,954	1,701	196	1,057	1,192	1,187	353	141	81	18	10,215,554	4,609
Cumulative 1949	11,695	6,631	816	4,248	4,250	4,825	1,545	722	305	48	42,940,002	
Cumulative 1948	11,350	6,570	859	3,921	4,459	4,609	1,380	602	300		39,721,807	

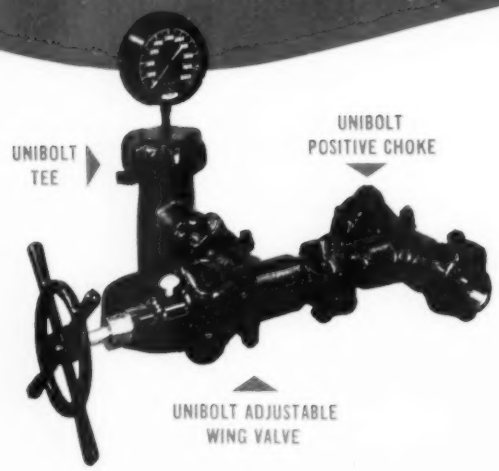
*Incl. 133 service wells: N. Y. 34, Pa. 90, Ohio 2, Kans. 3, No. Tex. 3, Miss. 1. †Incl. 29 distillate wells: Okla. 1, W. Tex. 1, E. Tex. 5, Tex. Gulf 8, S.W. Tex. 4, No. La. 4, So. La. 4, Ark. 1, Miss. 1. ‡Incl. all wells rigged up and or drilling at end of month.

UNIBOLT *Flow Manifolds*

PREFABRICATED

AS YOU LIKE 'EM





Here's another reason why UNIBOLT Flow Manifolds are preferred by many production men: the units of this manifold—Unibolt Adjustable Wing Valve, Unibolt Positive Choke Body, and Unibolt Tee, or Cross—may be assembled in a number of combinations to best meet individual requirements . . . a Unibolt Tee, or Cross, with either one or two Adjustable Wing Valves, and with either one or two Choke Bodies. The Wing Valves can be arranged for flowing with or against the stem, and the Positive Choke Body may be rotated to any desired position to facilitate tying-in with the flowline. It's truly flexible.

Add to this such features as: lighter weight, greater strength, lower first cost and maintenance, plus the fact that any of its parts may be safely and easily replaced in the field, and you have the reason why more and more operators are specifying UNIBOLT Flow Manifolds.

Available in regular forged steel or in high-chrome alloy for corrosive wellls—6,000, 10,000 and 15,000 lb. test.

THORNHILL-CRAVER COMPANY

Houston, UNIBOLT **Texas**

International

WORLD-WIDE OIL DEVELOPMENTS

Sinclair Petroleum Spuds First Well Ever Drilled in Ethiopia

THE first oil well ever drilled in Ethiopia was spudded in May 17 by Sinclair Petroleum Co. at a location in the Gumburo Hills district of the Province of Ogaden.

The start of drilling operations after about 3 years of exploratory work was made an event of significance in the country when Emperor Haile Selassie, his son, the Duke of Harrar, and other military and civilian officials from Addis Ababa, the capital, flew to the site for the occasion.

Stacy Adams, Sinclair's European representative, and Rene Bender, in charge of the company's Addis Ababa office, reported to Sinclair officials in New York that the emperor personally started the machinery moving after declaring he was highly pleased with the modern camp facilities and progress of the work preparatory to actual drilling. Adams, as representative of Leland Stanford, Sinclair Petroleum president, presented the emporer with a gold medallion commemorating the event.

Formations Govern Depth

The Gumburo Hills location is about 475 miles east-southeast of Diredawa, where Sinclair's main camp is located. A National 100 rig is being used, and depth to which the hole will be taken will depend on formations encountered. Surface geology determined the well location.

More than 3,000 tons of material and equipment required for the operation have been shipped to Ethiopia from the United States. The Sinclair company had originally planned to spud earlier this year, but it was necessary first to locate water. The successful water well which Sinclair drilled is said to be the first well of its kind in the semidesert Ogaden area.

Sinclair obtained the concession in 1945. It grants all development rights in the entire country to Sinclair for 5 years. Then 50 per cent of the area is to be released. After another 5-year exploratory period, 25 per cent more is to be released. The remainder will be under concession for 50 years.

Creole Position Strong Despite Budget Cut

WHILE the company's budget has been cut 31.5 per cent and economies are being made where possible, Creole Petroleum Corp. continues in a basically strong position despite the recent sharp production cutbacks.

In a discussion at the annual stockholders meeting May 19, A. T. Proudfit, Creole president, reported that the company's daily average production in the first quarter was 515,251 bbl., including purchased royalty oil. This compares with 619,381 bbl. daily in December 1948 and represents a drop of some 17 per cent.

"While it is no doubt disappointing that we cannot continue to report production increases as we have for the past 6 years, the reduction, viewed in full perspective, is less serious to the welfare of the company than it appears," Proudfit said. "If we continued through 1949 at our first quarter production, the year's production would average 19 per cent lower than 1948 but would be only 6 per cent lower than for 1946 which we all considered a good year."

Demand Increase Seen

Proudfit further said there are indications that "demand for heavy crude oil will begin to increase about the middle of this year. Demand for light crude has continued to hold up, and we expect to produce our maximum volume of this type. As a result, we may end the year with a total production close to our 1947 result."

Though reporting first quarter earnings 38 per cent below last year's similar period, the Creole president said the company's position is stronger due to an expanded plant, larger reserves, and producing potential, and more efficient facilities.

He said Creole is conducting an intensive program throughout the organization to obtain "maximum economies." One of the most immediate concerns of the company, he said, is that capital expenditures must continue greater than ordinary. Such expenditures in 1948 were $165,000,000 and "conditions make feasible and necessary the deferment of certain expenditures that ultimately will be required.

Financing Assured

"Our budget for 1949 now stands at approximately $113,500,000," he said. "This amount includes $50,000,000 for this year's work on Amuay refinery and for completion of the Ule-Amuay pipe line. The intermediate pumping station at Dabajuro began operation late in April and, after a normal shakedown period, the line is now pumping 300,000 bbl. daily.

"Because of reduced production and income in 1949, it is possible that we may find it necessary to acquire additional working capital. In such an event, we have assurances from Standard Oil Co. (N.J.) that it will supply the funds when needed."

Plans for New Dominican Refinery Being Completed

Location, size, and type of a proposed $15,000,000 refinery to be erected in the Dominican Republic were being discussed in a meeting this week in Ciudad Trujillo between government officials and representatives of International Industrial Consultants, S.A., which has the contract for construction of the refinery.

Those participating included Harold J. T. Horgan, of the Caracas office of I.I.C.; A. K. Brinsmade, process engineer with M. W. Kellogg Co., on leave from the company to act as coordinator of technical and economic studies preliminary to construction; Temistocles Messina, secretary of state for national economy, and other government representatives.

The refinery, as originally proposed, would be a 25,000-bbl. unit to operate on imported crude. Principal purpose of the refinery is to reduce fuel costs of industry in the republic

Drilling Activity to Be Stepped Up in Mexico's Reynosa Field

by Antonio Garcia Rojas*

THE Reynosa field, located in northern Mexico about 6 miles south of Hidalgo, Tex., is of particular interest because it is the first commercial oil-field discovery made in that part of Mexico and represents one of the first oil fields brought in by Petroleos Mexicanos since expropriation. (See Fig. 1.)

When Pemex exploration activities in that area took a formal shape, after compilation of all available geological and geophysical information, it was decided to carry a gravity survey in the area east of the Oligocene-Eocene contact, where surface geological information fails to show the subsurface structural conditions. This regional gravity work was used as a base for planning the seismic survey which has been carried on continuously since April 1944.

The gravity work disclosed the existance of a minimum southwest of Reynosa. Shooting of this minimum began in the middle of September 1944. This seismic survey showed the Reynosa structure in the eastern flank of the gravity minimum, and about 6 miles south of Reynosa city. According to the seismic picture, the Reynosa structure is an elongated, closed anticline with a northwest-southeast axis, about 5 miles long and with a maximum width of about 3 miles. The seismic closure is of the order of 50 meters (150 ft.), at a depth of 1,800 meters (6,000 ft.). A location was recommended by July 1945 in the center of the broad northern end of the structure.

*Chief geophysicist for Petroleos Mexicanos.

There were no wells drilled in Mexico in the vicinity of the proposed Reynosa location at the time the well was staked, and little geological information had been obtained by Pemex from neighboring areas. A tentative geological column of the well as well as a testing and sampling program for it was prepared in order to obtain all pertinent information. It was realized that under conditions prevalent in Mexico, where wells are scattered over a very wide area, that the necessity of obtaining a good log of a well is much more important than in areas where density of drilling is much greater.

All wildcats to be drilled by Pemex are recommended by the exploration department, and when they are submitted for discussion and approval a map, similar to that of Fig. 2, is made available for the production department, together with subsurface data, probable geological column, and recommended sampling and testing program.

The discovery well, Reynosa No. 1, was spudded in on February 17, 1948, and finished on August 16, 1948, at a total depth of 8,114 ft. From the surface to a depth of 1,792 meters (5,880 ft.) cuttings of the well were collected, but no coring was made. From 1,792 to 2,408 meters (5,880 to 7,900 ft.) continuous coring was made, and from there to the final depth. Hycalog equipment was installed and no more coring was done.

All indications of oil and gas found during the drilling were tested with formation testers, and a sand which was not detected during the drilling (Reynosa sand) but found while interpreting the electrical log, was sampled later with side-wall cores and was discovered to have oil. In total, two oil sands and three gas sands were found in Reynosa No. 1 at the following intervals:

4,615-4,630 ft.	Reynosa sand (oil)
6,468-7,535 ft.	First gas sand
6,819-6,840 ft.	Second gas sand
6,910-7,032 ft.	Third gas sand
7,071-7,097 ft.	Pemex sand (oil)

Casing was set in Reynosa 1 as follows:

First string 16-in. casing set at 148 meters (486 ft.).

Second string 10¾-in. casing set at 975 meters (3,200 ft.).

Third string 7-in. casing set at 2,170 meters (7,120 ft.).

The hole was finished in the Pemex sand by gun perforation between 2,156-2,157.4 meters (7,075-7,078 ft.)

After installing 2½-in. production lines, the well was put into production, flowing 480 bbl. per day through a ¼-in. choke.

The second well, Reynosa No. 2, was drilled near Reynosa No. 1 in

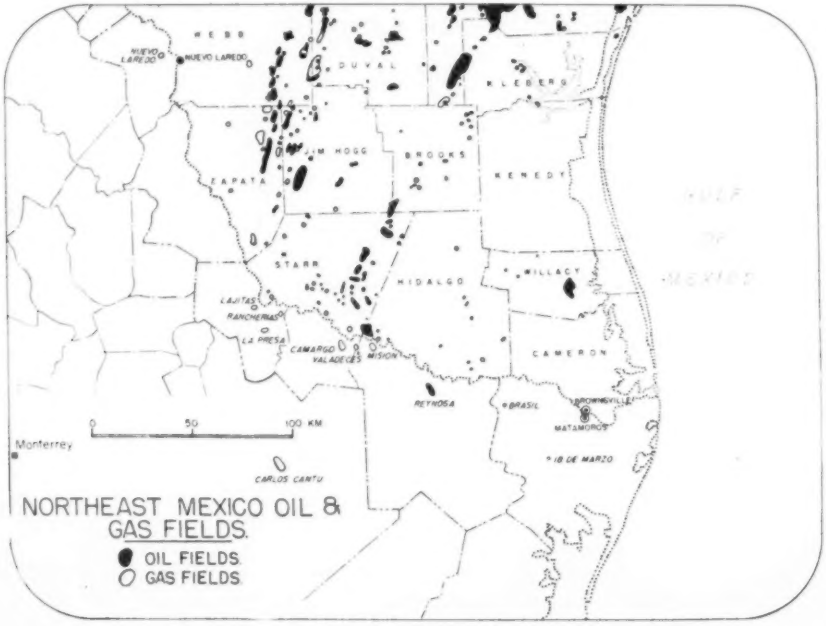


Fig. 1: Map showing location of Reynosa oil field

order to test the Reynosa sand, and was finished on August 16, 1948, at a total depth of 1,420 meter (4,659 ft.) flowing 667 bbl. per day through a 2/16-in. choke.

Since the discovery of the Reynosa field Pemex has drilled seven wells, six of which are oil producers and one a gas and distillate producer.

All productive sands in the Reynosa field belong to the Frio formation, which has shown to have an upper shale section with a few interbedded sands and lower section consisting mainly of sands. Good electrical correlation has been established between the Reynosa wells and those drilled in Hidalgo County, Texas (see Fig. 3).

All wells drilled fall in the upper flat section of the structure and until the time this paper is written a very small relief has been found—checking in this way the seismic picture shown in Fig. 2.

Development on the field is being continued at present with five rigs and two more which will be put in operation very soon, and the locations are being planned in a way to determine the field limits.

The oil produced is being sent by pipe line to the railroad station at Reynosa and thence to Monterrey or sold to American interests operating around McAllen, Tex.

The daily production of the Reynosa field as of February 1, 1949 was:

Well	Daily production
Reynosa No. 1	480 bbl. of oil
Reynosa No. 2	670 bbl. of oil
Reynosa No. 5	3,000,000 cu. ft. gas
Reynosa No. 8	670 bbl. of oil
Reynosa No. 9	380 bbl. of oil
Reynosa No. 11	160 bbl. of oil
Reynosa No. 13	250 bbl. of oil

Petroleos Mexicanos became interested in the development of Northeast Mexico immediately after expropriation, but active work in that area began in 1943 and has been increasing continuously since. Prior to 1938 northeastern Mexico had been studied by different oil companies which had succeeded in discovering the Rancherias, Lajitas, and La Presa gas fields, but no commercial production of oil had been found.

ACKNOWLEDGMENT

The writer wishes to express his appreciation to Antonio J. Bermudez, general director of Petroleos Mexicanos, Jose Colomo, chief of the coordination department and Manuel Rodriguez Aguilar, chief of the exploration department, for their kind permission for the publication of these data. He also wishes to express his thanks to his fellow workers in the exploration department of Petroleos Mexicanos who helped in the preparation of the paper. These men actually have collected most of the information about northeast Mexico in such a form as to have it available for quick reference.

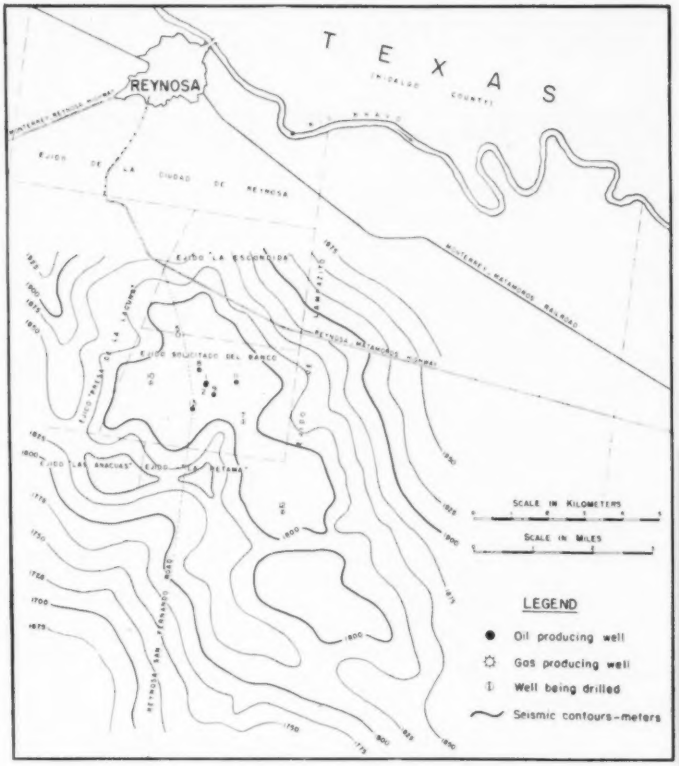


Fig. 2: Structural map of Reynosa oil field

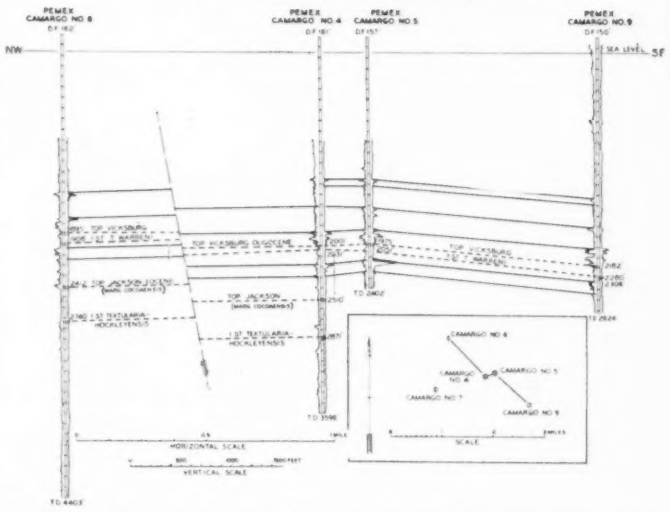


Fig. 3: Cross-section and indicated correlation across the axis of seismic structure at Camargo

BIBLIOGRAPHY

Eduardo Guzman. Exploration and Development Work in the Tertiary Basin on N.E. Mexico. (Paper read at the XV Meeting of the South Texas Geological Society.)

William G. Kane. Structural Geology of Border Province of Northeastern Mexico Adjacent to Lajita, and Starr County, Texas. A.A.P.G. Bulletin, Vol. 20, No. 4.

Major Decline in World Crude Production Effected in March

WORLD production of crude oil showed a major decline in March, falling 255,000 bbl. daily from the previous month to approximately 9,190,400 bbl. daily.

The Oil and Gas Journal's monthly survey of crude-oil production throughout the world discloses that the major part of the March drop came in the United States and in Venezuela. In the Middle East total production was down a relatively negligible amount, and many of the smaller producing countries registered slight gains during the month.

The world production decline in March gives further confirmation to a trend which became apparent late last year. It was the third successive month of production cuts in Venezuela, and the fact that total Middle East output declined even a small amount is significant. A slackening off in rate of demand for petroleum products world-wide, coupled with a shortage of currency in some countries, is responsible for decreases. Venezuela's heavy fuel-oil-type crude has been closed in some cases, and exports from the Middle East into the United States are being reduced.

Percentagewise, the March reduction in over-all world output amounted to approximately 2.7 per cent. In the United States the drop from 5,376,000 bbl. daily to the estimated 5,182,000 bbl. daily in March represented about 3.5 per cent. Venezuela's reduction of 78,600 bbl. daily from February to 1,155,400 bbl. daily in March was a drop of 6.4 per cent. For all foreign areas, excluding Russia and Eastern Europe, production in March was reported at 3,280,300 bbl. daily against 3,340,900 bbl. daily in February, a decline of 1.8 per cent.

Mexico Output Up

There were few major changes in the Western Hemisphere outside Venezuela and the United States. Mexico's estimated production rose from 153,000 bbl. daily in February to 160,800 bbl. daily in March. Canadian output continued upward with further development of the northern Alberta fields, but here production is expected to reach its maximum soon, and further gains will await completion of pipe-line outlets out of the immediate consuming area. Production in Colombia in March reached a record 83,978 bbl. daily, but since then one heavy crude field has been shut in. De Mares supplied a reported 31,018 bbl. daily of the total Colombian production for March, and 26,306 bbl. daily came from the Barco.

WORLD CRUDE-OIL PRODUCTION

(In thousands of barrels daily)

Country—	March 1949*	Previous month
Western Hemisphere:		
Argentina	67.0	65.4
Bolivia	1.9	1.9
Brazil	0.4	0.4
Canada	55.0	51.5
Colombia	84.0	78.4
Cuba	0.1	0.1
Ecuador	7.2	7.2
Mexico	160.8	153.0
Peru	40.0	39.8
Trinidad	57.0	56.9
Venezuela	1,155.4	1,234.0
Total	1,628.8	1,688.6
Europe and Africa:		
France	1.1	1.0
French Morocco	0.4	0.4
Germany	14.6	14.4
Italy	0.2	0.2
Netherlands	11.4	12.0
Egypt	41.0	38.0
United Kingdom	0.9	0.9
Total	69.6	66.9
Middle East:		
Bahrein	29.8	30.6
Iran	565.9	527.3
Iraq	64.2	53.1
Kuwait	243.7	256.7
Saudi Arabia	489.8	532.3
Total	1,393.4	1,400.2
Far East:		
British Borneo	67.0	65.0
Burma	0.5	0.5
China	1.8	1.8
India	5.3	5.3
Indonesia	105.0	105.0
Japan	2.6	2.6
New Guinea	4.4	4.0
Pakistan	1.9	1.0
Total	188.5	185.2
Total foreign less Russia and E. Europe	3,280.3	3,340.9
Russia and E. Europe:		
Albania	1.0	1.0
Austria	17.5	17.5
Czechoslovakia	0.9	0.9
Hungary	10.0	10.0
Poland	2.6	2.6
Romania	80.0	80.0
Russia	615.0	615.0
Yugoslavia	1.1	1.1
Total	728.1	728.1
Total foreign	4,008.4	4,069.0
United States	5,182.0	5,376.0
World total	9,190.4	9,445.0

*Figures for March are authoritative for all countries in the Middle East and most of the more important producing countries in the Western Hemisphere and Europe. Where a reliable figure for the March production was not available, the daily average for the previous month has been carried forward. No up-to-date information is available for Russia and the Russian-dominated countries of Eastern Europe, and here the figures reflect latest data obtainable. Other information is from official government or company reports or reliable private sources.

Weekly reports of Venezuela's total production indicate that April output will reverse the decline of the preceding few months. For the week ended April 4, production of 1,177,686 bbl. daily was reported; for the week ended April 24, production was reported at 1,192,586 bbl. daily.

As a result of the new discoveries on the Sinai Peninsula, production in Egypt continues to climb. March output was reported at 41,000 bbl. daily, and in recent weeks production has reached about 49,000 bbl. daily. Increasing production in the Emsland area of western Germany brought total output in this country to 14,600 bbl. daily. This is for the Allied-controlled areas in which all production of importance is located. The Dutch continued to hold Schoonebeck field to about 11,400 bbl. daily, considered the economic level in view of water encroachment and other problems.

Iran, Iraq Show Gain

Two of the five Middle East countries, Iran and Iraq, showed production increases in March over February. Anglo-Iranian Oil Co., Ltd., stepped up production from its Iranian fields near 50,000 bbl. daily over the preceding month when output had fallen to 527,300 bbl. daily. Despite the continued shutdown of the Kirkuk-Haifa pipe line due to the political situation, Iraq production, mostly by Iraq Petroleum Co., Ltd., rose to slightly more than 64,000 bbl. daily from about 53,000 bbl. daily in February.

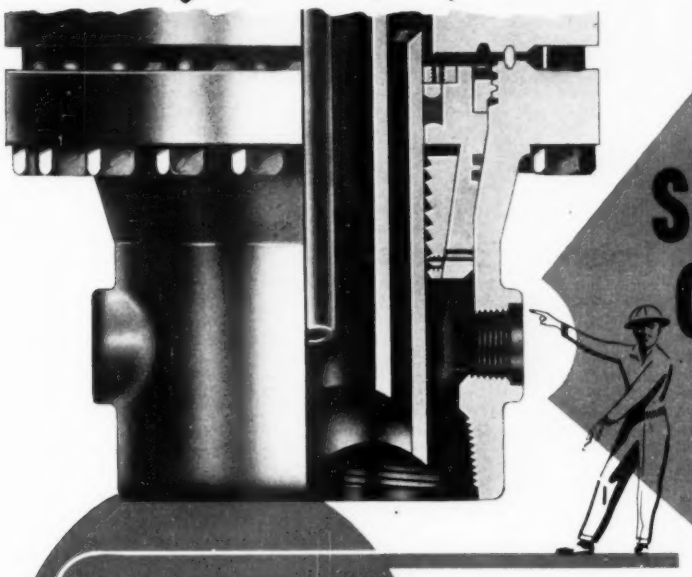
Reported production in Kuwait in March was about 244,000 bbl. daily, a slight decrease from February. The major March drop in the Middle East came in Saudi Arabia, where production fell from 532,300 bbl. daily in February to 489,800 bbl. daily in

VENEZUELAN PRODUCTION BY PRINCIPAL FIELDS (MORE THAN 10,000 BBL. DAILY)

(In thousands of barrels daily average)

Field—	Mar.	Feb.
Cabimas	41.3	48.6
Lagunillas	308.0	336.2
Tia Juana	82.6	111.0
Bachaquero	64.4	65.0
La Paz	129.0	114.0
Mene Grande	46.8	46.6
El Cubo	10.9	10.7
Mara	73.1	65.4
Quiriquire	55.9	77.7
Temblador	11.0	11.0
Oficina	40.7	44.0
Jusepin	33.8	35.1
San Joaquin	11.0	11.0
Nipa	31.0	31.0
Las Mercedes	15.0	14.5
Santa Barbara	23.7	24.6
Guico	13.8	14.3
Mulata	18.2	19.1
Guara	72.4	76.0

McEvoy Presents



THE SAFEST CASING HEADS

Actual tests prove beyond doubt that this new casing head with the new slip suspension McEvoy hangers will safely support (without bottlenecking) any string of casing that will support itself!

THE NEW McEVOY Casing Heads feature a longer body to provide greater back-up area for the slips, and two new slip suspension casing hangers which have been redesigned to take full advantage of the extra back-up area.

This new design completely eliminates bottlenecking of the casing by the slips! Stresses are distributed so evenly that these new hangers are actually stronger than the casing string itself.

Acme threads above the taper in the body, combined with a locking ring, positively prevent upward movement of the hanger.

Furthermore, in keeping with McEvoy's standards of interchangeability, all earlier McEvoy casing hangers will fit in this new head.

The result is a stronger, safer well head assembly that is rapidly becoming the first choice of leading producers all over the world. Write for full information, including reports on the tests that prove the capacity of these new heads.

For greater safety and lower replacement costs on corrosive wells

Specify **McEVOY All-Stainless CHRISTMAS TREES and VALVES**

ASSOCIATION OF WELL HEAD CERTIFIED Equipment MANUFACTURERS

McEvoy COMPANY

TEXAS AND MILBY ST. • P. O. BOX 3127 • HOUSTON 1, TEXAS

Export Representative: E. F. Gahan, Inc., Room 1223, 500 Fifth Avenue, New York, N. Y.

March. Arabian American Oil Co.'s program calls for an average production this year between 500,000 and 525,000 bbl. daily, and the company's April report, since issued, shows that output moved back up to 523,555 bbl. daily.

Over all in the Middle East, March production was down about 7,000 bbl. daily from the previous high of 1,400,000 bbl. daily in February.

Complete and up-to-date information on all the producing countries in the Far East is not available. This condition is due in some cases to disturbed political conditions. Best information places total output for this area in March at about 188,000 bbl. daily.

Production totals in the so-called Iron Curtain countries continues to be a subject of speculation. No official production figures in Eastern Europe have been issued for more than a year in most cases, and estimates of Russia's output is largely guesswork, though it was recently disclosed that the Soviets have been increasingly hampered by equipment shortages. A Soviet company recently brought in new production in Austria at Matzen, northwest of Vienna, on a structure mapped before the war, but details of this operation are closely guarded.

Immediate Speedup in Tapline Work Planned

WASHINGTON. — Approval by the Syrian cabinet last week of transit arrangements has cleared the way for completion of the 1,140-mile Tapline project, a $200,000,000 program to carry oil from Arabian American Oil Co. producing fields in Saudi Arabia across the desert to the Persian Gulf.

An Aramco spokesman said this week that the Syrian agreement calls for the payment of a minimum transit fee of 20,000 pounds sterling annually which will cover the movement of up to 300,000 bbl. daily through the line. If more than the initial capacity of the line is moved, the transit fee will be adjusted accordingly on the basis of approximately ½ cent per ton for the additional oil. The same rates also apply to transit through Lebanon and Trans-Jordan.

In addition, Syria will receive around $160,000 a year for policing the line, and the right to buy 200,000 tons of oil annually for use within the country at the world price.

Lebanon is to receive 2 pence per ton for all oil shipped through the Sidon terminal, to cover all harbor charges, taxes, and dues.

The Syrian agreement was the last of a series which included Saudi Arabia, Trans-Jordan, and Lebanon. Pending completion of arrangements for laying the line in the western end of the route, construction has been going on in Saudi Arabia at a rate of 1 mile per day, and about 225 miles have been laid so far.

The rate of progress on the Saudi Arabian end now will be speeded up to 1½ miles daily, and the company hopes to have men and materials working on the western end by late summer and have the job going full speed by early fall.

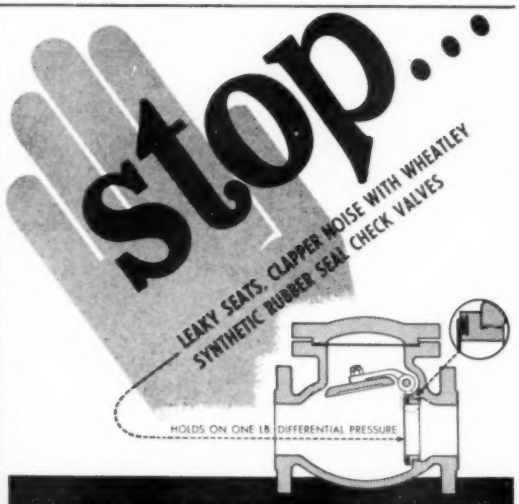
The western third of the line is to be constructed by Williams Brothers Overseas Corp., of Tulsa, whose crews will meet those of Bechtel Brothers, who are building the eastern section, somewhere in western Arabia, probably near the Trans-Jordan border, in August 1950.

The terminal facilities at Sidon will start with a pier out to 15 ft. of water to accommodate small craft bringing in supplies. A series of possibly as many as six 30-in. submarine loading lines will be connected with the proposed Sidon tank farm, and will load oil by gravity from 16 180,000-bbl. tanks.

Reportedly, the project will require about 400,000 tons of pipe, of which 260,000 tons will be line pipe and the rest gathering lines and other facilities.

THE OIL AND GAS JOURNAL

"—then I said, if you think I'm gonna carry you around a dance floor half the night, you're nuts!"


Stop...
LEAKY SEATS, CLAPPER NOISE WITH WHEATLEY SYNTHETIC RUBBER SEAL CHECK VALVES
HOLDS ON ONE LB. DIFFERENTIAL PRESSURE

Semi-steel and steel check valves; API 2" to 30"; bronze clapper, replaceable synthetic ring seal. Holds with weight of clapper alone. Resists abrasive action, wear. Seals around foreign particles, muffles clapper noise. Flanged, screwed, or both.

FRANK W. WHEATLEY

TULSA . . . WHEATLEY . . . OKLA.

WRITE FOR LATEST PUMPER AND CHECK-VALVE BULLETIN

Texas Allowable Cut 32,285 Bbl. In Sixth Consecutive Reduction

CORPUS CHRISTI. — For the sixth consecutive month, a cutback in Texas crude production has been ordered by the Railroad Commission. The reduction is 32,285 bbl. as compared with May 14 production. Since January 1, the commission has reduced the state's output by approximately 840,000 bbl. daily—more than twice the production of the state of Oklahoma.

In conjunction with the latest cut, commission chairman W. J. Murray emphasized that the order actually will maintain production at approximately the May 1 rate. The latest proration schedule, he said, will allow a daily production of 1,987,157 bbl. of crude, or 32,285 bbl. less than on May 14. However, this figure totals approximately the amount added to the state's production by discovery wells over the past month. Murray stated that about 35,000 bbl. is allowed monthly for new discoveries.

To Produce 18 Days

The June order provides for 18 producing days for all prorated fields, except East Texas, where 16 producing days will be allowed. This involves no change in shutdown days from May, which had 19 producing days for all expect East Texas, which had 17 days. The reason for equivalent shutdown days is that May is a 31-day month whereas there are 30 days in June.

Purchaser nominations for June were 440,627 bbl. above the allowable granted. Nominations totaled 2,427,884 bbl., a decline of 88,387 from May.

Natural-gasoline and distillate production for June is estimated at 251,237 bbl. daily, which will give the state a total allowable production of 2,238,394 bbl. daily. However, actual production usually runs about 5 per cent below the allowable.

In the discussion preceding the commission's order, Guy I. Warren, vice president of Renwar Oil Corp., Corpus Christi, queried as to the possibility of special allowables to provide light fuel oil to be shipped abroad. In replying, the commission reaffirmed its past policy of making allowable adjustments "across the board" with no preferential treatment to any particular area.

Maston Nixon, vice president, Southern Minerals Corp., Corpus Christi, advocated an increase in allowables. He said, "We have just about reached the point where our allowables can go up. Our company will take any connections possible in any field where we are purchasing. We now have our lowest working stocks in history."

During the hearing, Olin Culberson, a commission member, recommended that operators slow down on requests for exemptions from shutdown. The Austin docket for the commission is a month and a half behind on such requests he told the operators.

No Drop in Other States

Culberson called attention to the fact that while Texas production has been cut back sharply during the past few months, little changes have been made in other oil-producing states. He said Oklahoma crude stocks increased by 1,600,000 bbl. during the period while Texas stocks, with the exception of the Gulf Coast, were declining.

R. W. Thompson, Cosden Petroleum Corp., Big Spring, asked that Howard-Glasscock field, which is now exempt, be returned to the shutdown schedule. He said two purchasers handling 75 per cent of the field's production are preparing pipe-line connections. This company proration is considerable less than current allowables, he added. Thompson told the commission, "There is no market in West Texas for fuel oil. It is the commission's duty to prorate. The pipe-line companies don't like to do it."

The next statewide hearing will be held June 17 at the Hotel Beaumont in Beaumont.

Johnson Asks Funds for Military Oil Facilities

WASHINGTON. — Approval of a $623,000,000 construction program involving the purchase and rehabilitation of a number of commercial oil facilities and the building of storage facilities at a number of points both within and outside the United States were asked of Congress last week by Defense Secretary Louis Johnson.

Under the program, the Army plans to expend $6,800,000 on the construction of terminal storage at the Eilson Air Force Base in Alaska, $315,000 on a survey of the Valdez pipe line in Alaska, and would increase the storage for new-type fuels as part of an $840,000 expansion program at the Malta Test Station, N. Y.

The Navy has three large projects involving oil, calling for the expenditure of $14,200,000 for additional storage facilities at the Naval Supply Center, Guam; $3,600,000 for 200,000 bbl. of aviation gas storage at various points and $3,175,000 for acquisition and expansion of a residual terminal facility, including tankage, pipe lines, and accessory construction, at the Naval Fuel Storage Facility at Jacksonville, Fla., and contemplates also additional gasoline storage as part of a $2,230,000 program at the Naval Auxiliary Air Station at Miramar, Calif.

The program for the Air Force carries $141,000 for purchase and rehabilitation of the Mohawk Oil Co. plant at Bakersfield, Calif.; $767,000 for acquisition of additional operating facilities, including the Wilshire and Sunset Oil Co. plants at Norwalk, Calif.; $200,000 for the purchase of the General Petroleum Terminal No. 2 facilities at Tacoma, Wash., and $537,339 for purchase of the Panama City Oil Co. plant at Panama City, Fla.

The Air Force also proposes to construct aviation-fuel storage facilities at its bases at El Paso, Merced, Calif.; Savannah, Ga.; Great Falls, Mont.; San Rafael, Calif.; Temple, Tex.; Limestone, Me.; Tampa, Fla.; Trenton, N. J. ($700,000); Muroc, Calif.; Falmouth, Mass.; Mt. Clemens, Mich.; Spokane, and Roswell, N. M.; as part of general construction programs at those points, and earmarks $14,200,000 for additional strategic bulk petroleum storage facilities at locations to be determined later.

Ball Given Service Medal By Interior Department

WASHINGTON.—A gold medal for distinguished service to the Interior Department was awarded to Max W. Ball last week by Secretary J. A. Krug. All told, as a young man and again during the war and later as director of the Oil and Gas Division, Ball served 15 years in oil and gas activities.

Another of the 8 to whom gold medals were awarded was Gerald Fitzgerald, chief of the topographic branch of the Geological Survey, with 25 years of service.

A silver medal for meritorious service was conferred upon William A. Kearney, formerly with the Conservation Division and now in the Oil and Gas Division, with 42 years' service.

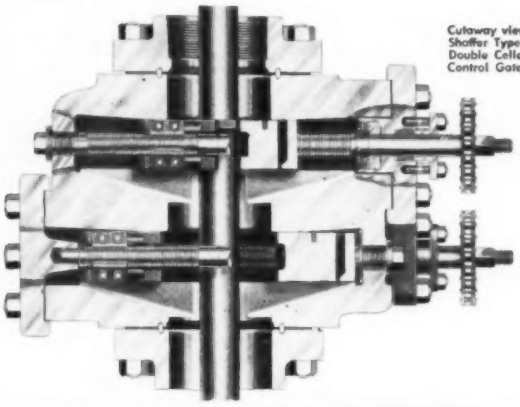
Oil Progress Week Will Be Observed This Year

Last year's Oil Progress Day will be Oil Progress Week in 1949, it was decided last week at a meeting of the Oil Industry Information Committee in San Francisco.

The event will be held October 16-22. Duration of the event was extended because of the enthusiasm developed throughout the nation last year, the committee said.

Close it AND IT STAYS CLOSED!

Open it AND IT STAYS OPEN!



Cutaway view of Shaffer Type 45 Double Cellar Control Gate

The rams in a SHAFFER GATE stay wherever they are set...

without locking devices of any kind

WHEN YOUR WELL is protected with Shaffer Cellar Control Gates no secondary operations are needed to make sure the rams stay where they are set. This is a *double* advantage...

When the gate is closed

the rams stay closed *automatically* without need for anyone to go near the gate to "lock" it or for other closing operations. This not only saves vital time in emergencies but also eliminates risk of forgetting any locking operations—*because none are necessary!*

When the gate is open

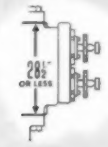
the operation is equally simple. There's nothing to unlock or disengage. You simply open the Gate. And when the rams are in the open position, they *stay* open automatically. No creeping rams to block the hole—no risk of damaging the rams when running bits or tools in or out of the well!

This Shaffer feature of positive ram operation is one more of so *many* vital Shaffer advantages that no operator should fail to get the *complete* Shaffer story before purchasing any cellar control gate equipment. Let us give you further details on the multiple Shaffer Cellar Control Gate advantages, a few of which are highlighted at right.

Write for your free copy of the Shaffer Catalog.

See pages 3843 to 3894 of your 1948 Composite Catalog for data on the complete Shaffer line.

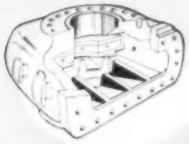
YOU GET VITAL ADVANTAGES LIKE THESE IN SHAFFER CELLAR CONTROL GATES!



GREATER COMPACTNESS—*cellar saving compactness that permits closer hook-ups, reduces cellar dimensions, saves time and money on every rig installation throughout life of Gate!*

MAXIMUM POWER ADAPTABILITY—*choice of air, steam or electric power drives—plus full manual standby—is yours with Shaffer Gates. All drives are compact, simple, positive, quick!*

EASY RAM CHANGES—*only one end cover need be removed to change both sides of ram assembly. Saves time, saves work!*



MUD FREE OPERATION—*bottoms of Shaffer ram compartments are sloped sharply downward, with rams travelling on high narrow ribs. Mud drains quickly out of Gate—does not interfere with free operation of rams!*

Plus **MANY OTHER VITAL SHAFFER ADVANTAGES.** ***No other cellar control gate has so many important operating features . . . requires so little cellar space . . . is so trouble-free and dependable on all modern drilling programs!***

25 Years OF OIL TOOL LEADERSHIP

SHAFFER

HIGH PRESSURE DRILLING AND CONTROL EQUIPMENT • FISHING TOOLS THAT EXCEL

SHAFFER TOOL WORKS, Brea, California • California Service Shops: Santa Fe Springs and Taft
HOUSTON, TEXAS, 6006 Navigation Blvd. • ODESSA, TEXAS, 1925 West Second Street
OKLAHOMA CITY, OKLAHOMA, Acme Oil Tool Company, 1001 S. E. 29th Street
EXPORT SALES OFFICE: Shaffer Tool Works, 500 Fifth Avenue, New York, N. Y., U.S.A.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Oil Pool

WASHINGTON.—United States and Canadian officials for some time have been discussing North American security and making plans for hemispheric defense in the event either country is attacked.

Purpose of the talks, it is understood, is to develop what might be termed a modus operandi for using the resources of the two countries as a unit in the event of war, to all intents and purposes wiping out the United States-Canada boundary line.

As would be expected, oil is one of the important subjects of discussion, the idea being to develop an informal agreement, which could be quickly formalized if needed, to give the United States full access to the rapidly developing Canadian oil supplies which, in the event of war, might be vitally important to a United States possibly cut off from supplies by sea, as it was in 1942.

No secrecy surrounds the fact that plans are being made for joint hemispheric defense, but no information is being disclosed regarding the details of those plans beyond an acknowledgment that oil is one of the resources which Canada and the United States would pool.

Recession in Oil

FROM the standpoint of oil activities, Washington is in the deepest depression it has known in 15 years.

From the Capitol to the Pentagon, officials shrug their shoulders when asked what is going on in the field of oil, and while a lot of things are cooking, there is no indication that any of them will be ready for serving at any time in the near future.

Little oil legislation is in prospect in Congress, where the most immediate possibility is the passage of legislation revising the Natural Gas Act to insure the exemption of independent producers and gatherers from Federal Power Commission control. President Truman has not indicated any stand on that subject, but if he listens to a majority of the present FPC he is likely to veto such legislation.

Another effort is likely to be made to put through some tidelands legislation, but anything at all favorable to the states is doomed to be vetoed unless the President can be prevailed upon to change his mind.

A third measure on which action will be sought is the bill for a moratorium on Federal Trade Commission proceedings involving delivered pricing or freight absorption, designed to give Congress a chance to make a real study of the problem developed by the Supreme Court's ruling in the cement case and draft permanent legislation to be enacted next year.

Other phases of the oil situation may be studied but are unlikely to result in any legislation. This would apply to the proposed Senate investigation of price increases on gasoline and the House interstate commerce subcommittee's review of current world conditions.

The departments, too, find themselves with few oil problems. The OGD, rocking along pending appointment of a permanent director, is merely marking time. An interdepartment committee is still working on an oil policy for the National Security Resources Board, which also still lacks a permanent head.

To cap it all, the two houses of Congress will be evicted from their spacious chambers on July 1 to permit reconstruction designed to prevent their roofs from caving in and will have to meet in committee rooms in their office buildings. Lack of elbow room and Washington temperatures are expected to make the statesmen long for the cool, open spaces and shorten a session which, if it were to do all the President has demanded, would go on and on and on.

New Fuel Saver

RECENT tests by the Department of Agriculture indicate that motor vehicles, even with high-compression engines, can get high-octane operation with low-octane gasoline by injecting alcohol and water into the carburetor when additional power is needed.

Alcohol is equivalent to 100-octane fuel and can be used to increase the effective octane rating of gasoline. Alcohol-water injection was used by the Air Force during the war to give planes a temporary boost in power and is still used to provide added power for take-off.

Two 938-mile test runs by agriculture motor-fuels specialists with trucks weighing 5 tons loaded, equipped for automatic injection of the alcohol-water mixture as needed, demonstrated the possibilities of the idea.

On the first run, the truck consumed 106.7 gal. of 58-octane gasoline and 8.85 gal. of alcohol and water, getting about normal mileage per gallon of gasoline, but because the alcohol served as fuel as well as increasing the gasoline's antiknock quality, there was an estimated saving in gasoline consumption of about 6 per cent. However, since the gasoline yield from crude declines about 1 per cent for every increase of 1 octane number, it is estimated that the use of 58-octane fuel rather than 74-octane represented a saving of about 16 per cent in terms of crude.

On the second trip a high-compression head (8.25-to-1 ratio) was used and it was found that each gallon of the alcohol-water mixture allowed the use of 21 gal. of 74-octane fuel in place of the 23 gal. of 85-octane gasoline that otherwise would have been required.

Department experts estimate that since a car will operate satisfactorily on gasoline of 50 octane number or even lower during at least 80 per cent of normal driving, when it is running on the level at speeds up to about 40 miles per hour, much of the antiknock quality of the higher-octane fuel ordinarily used is, in effect, wasted.

The use of alcohol mixtures, it is suggested, might be the answer to the problem raised by the current trend toward high-compression engines, which require super-octane fuels for which the oil industry would have to spend millions of dollars in refinery modifications. Large volumes of alcohol could be produced from a variety of crops and agricultural byproducts, and it is from this angle that the department is interested.

Foggy Future

EXTENSION of Federal Power Commission jurisdiction to independent producers and gatherers of natural gas is almost inevitable if Congress fails to amend the Natural Gas Act this session.

Because legislation is pending in Congress, the commission currently is refraining from any action to bring independent producers under its control, which a majority of the commissioners feel it was authorized to do by a 1947 decision of the Supreme Court.

But if that legislation, which now has been the subject of consideration by two congresses, fails the commission will feel free to take jurisdiction, a step which is seen in many quarters as the forerunner of an assertion of authority over oil operators whose wells produce gas in conjunction with oil.

The so-called "Rule 139," adopted by commission last year, established a hands-off policy with respect to

independent producers of gas. That rule has not been rescinded, and the commission so far has made no attempt to disregard it, although a majority of the present commissioners believe they have, and should exercise, authority, but if Congress adjourns without passing natural-gas legislation it will probably come off the FPC books quickly.

However, the future stand of the commission cannot be considered as finally settled. Commissioner Leland S. Olds' term will expire June 22, and as yet President Truman has neither renominated him nor named a successor. Olds is one of the group believing the commission should supervise production and gathering, and if he should be succeeded by a man who does not share his belief the balance of power in the commission would take another of its frequent shifts.

ASPB Change Effected; Board Told To Prepare Oil-Mobilization Plans

WASHINGTON.—The Armed Services Petroleum Board was ordered reconstituted as the Munitions Board Petroleum Committee last week and instructed by Defense Secretary Louis Johnson immediately to prepare plans for the board governing the military aspects of industrial mobilization on petroleum for a future emergency.

The assignment was 1 of 12 laid down by Johnson in switching the ASPB, formerly an independent agency to advise the Joint Chiefs of Staff, Munitions Board, Research and Development Board and the various branches of the military establishment regarding petroleum plans and policies, to a subordinate position in the Munitions Board.

The transfer is not expected to affect the personnel, which heretofore has been handling oil matters for the military establisment. Johnson's order provides that it shall continue the same functions for the board which it has performed in the past. To strengthen the position of the MBPC, he ordered that its staff shall not be duplicated by the establishment of other staffs for petroleum planning in any other military agency.

27 Boards Eliminated

At the same time, Johnson announced the elimination of 27 more boards and committees, including the Foreign Trade Policy Committee, Resources Rating Committee and Shipbuilding Industry Advisory Committee in the Munitions Board, and the Army Committee on Liquid Fuels and Lubricants and Army Packaging Board, bringing to 57 the number that have been liquidated in the past 8 weeks.

In addition to the development of war plans, Johnson assigned these specific duties to the petroleum committee:

Prepare for the Joint Chiefs of Staff or the Munitions Board evaluations of the petroleum feasibility of strategic or logistic plans based upon current estimates of potential production, procurement, and transportation capabilities maintained by the Armed Services Petroleum Board;

Analyze and review for the appropriate authorities, as directed, both current and mobilization programs for military requirements for petroleum as submitted by the services;

Coordinate for the Munitions Board policies and programs for the use of or disposal by the military departments of petroleum plants and facilities and on the maintenance of an adequate industrial reserve of petroleum facilities;

Conduct studies on those phases of industrial security concerned with petroleum facilities;

Advise the Munitions Board with respect to foreign trade and related matters which concern petroleum;

Prepare estimates of petroleum capabilities for war of foreign nations;

Furnish military establishment representation on interdepartmental committees on petroleum, and represent the military establishment in its relationships with the Military Petroleum Advisory Board;

Advise the Munitions Board on coordination of specifications and standardization of petroleum items;

Prepare such studies and perform such duties and functions in connection with petroleum matters as may be requested by the Secretary of Defense, the Joint Chiefs of Staff, the Munitions Board, the Research and Development Board, and the Secretaries of the Army, Navy and Air Force;

Advise the Joint Chiefs of Staff, Munitions Board, Research and Development Board, the Armed Services Petroleum Purchasing Agency, and the Secretaries of the Army, Navy and Air Force on petroleum policy matters, including comments and recommendations on petroleum legislation.

Exercise general direction, authority and control over the Armed Services Petroleum Purchasing Agency.

Scouts, Landmen Will Hold Houston Meeting

HOUSTON. — Five hundred scouts and landmen from all parts of the United States and Canada will gather here June 9-11 for the twenty-sixth annual meeting of the National Oil Scouts and Landmen's Association.

The 3-day meeting will be held in the Shamrock Hotel, according to Robert Wilson, Sun Oil Co. scout and general convention chairman. Major addresses for the session will be given by Thomas A. Link, consulting geologist of Toronto and Calgary, Canada, and R. B. Anderson, president of the Texas Mid-Continent Oil and Gas Association.

Papers Slated

Link, who is also vice president of the American Association of Petroleum Geologists, will discuss "Oil Developments in Western Canada." Anderson will speak on the second day of the meeting following welcoming addresses by Lt. Gov. Allan Shivers of Texas and Houston's Mayor Oscar Holcombe. In addition, a moving picture on drilling operations in the Gulf of Mexico will be shown the group.

A business meeting and election of officers will be held Saturday morning, the last day.

Committee on arrangements for the convention includes the following (all from Houston): Robert Wilson, Sun Oil Co., chairman; Dave Fransen, Humble Oil & Refining Co.; A. D. Hunter, Humble; C. W. McBride, Phillips Petroleum Co.; W. L. Miller, Superior Oil Co.; J. C. Nixon, Superior; J. Q. Snell, Tide Water Associated Oil Co.; John Wilson, Ohio Oil Co.; Lou Wysocki, Pan-American Producing Co.; W. E. Brown, Shell Oil Co.; and Paul Edman, Tide Water.

Nominees Named

Slate of candidates to be voted on at Houston for next year's officers includes: S. N. Jackson, Sun Oil Co., Dallas, and Lee C. Stedman, Pure Oil Co., Tyler, candidates for president; Fred Tyner, Pure, Roswell, N. M., and LeRoy Francis, Carter Oil Co., Jackson, Miss., first vice president; George Saverline, Sun, Shawnee, and D. J. Ridgeway, Phillips, Casper, Wyo., second vice president; Frank Fagan, Atlantic Refining Co., Wichita, and Charles E. Hewitte, Mid-Continent Petroleum Co., Wichita Falls, third vice president; Chester Geiger, Carter, Mattoon, Ill., and Gregory Rowe, Humble, Wichita Falls, secretary-treasurer, and Fred Alexander, Standard of Texas, Amarillo, and J. W. Sigley, The Texas Co., Evansville, Ind., yearbook editor.

More Petroleum to Be Used by Gas Utilities in the Future

NEW YORK.—The growing trend toward higher-B.t.u. gas for domestic consumption, and the attendant impact of natural gas, L.P.G., and petroleum-derived manufactured gas on the gas-utility industry, shared the bulk of attention at the annual production and chemical conference of American Gas Association held here May 23-25.

Technical personnel from all sections of the gas industry discussed the problems of catalytic and thermal cracking of petroleum hydrocarbons, the latest developments in high-B.t.u. oil gas, methods of estimating oil-gasification yields, and the economics of converting from manufactured to natural gas in small plants.

Research Studies Presented

Results of fundamental research on hydrocarbon cracking were reported in two papers prepared by members of the Institute of Gas Technology. Capt. E. S. Pettyjohn, institute director, discussed the potential use of catalytic and thermal hydrocarbon cracking in the gas industry and pointed to the important possibilities which the rapidly developing techniques offer to the gas utility.

H. R. Linden reported the findings to date of an A.G.A.-sponsored project on estimation of oil-gasification yields. On the basis of laboratory cracking operations, simplified methods for obtaining carbon-hydrogen weight ratios for selected oils were devised and three direct methods for estimating C-H ratios have been developed. Nomographs have been prepared for estimating such ratios, given gravity, distillation, aniline point, and kinematic viscosity for light distillates, intermediate oils, and residual oils. These basic values are then employed in equations to determine estimated enriching values and gas yields.

Hydrates Discussed

W. M. Deaton, U. S. Bureau of Mines, Amarillo, presented a paper reviewing the complex chemistry of natural-gas hydrates, a problem of long standing to producers, and a subject of increasing interest to distributors. Other subjects covered in the sessions included the use of L.P.G. as replacement for manufactured gas, problems of small gas plants pending advent of natural gas, and unusual maintenance when reforming natural gas.

Still another prospective source for public-utility gas was discussed by Bureau of Mines personnel who presented the possibilities of such gas as a byproduct of synthetic-liquid-fuels production from coal or shale oil. "Radioactive Tracers in the Gas Industry," a treatment of the status and importance of isotopes now available to industry researchers, revealed current and potential uses to which this new technique applies. *(For related information see page 129.)*

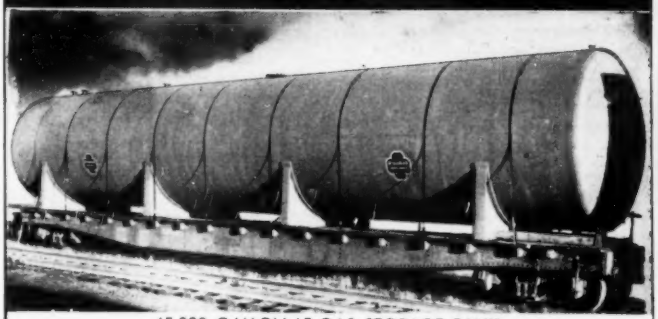
Rock Island Cut Prices Of Oklahoma Heavy Crude

Low-gravity oil in Oklahoma last week felt the effects of the recent widespread price cuts as Rock Island Refining Co., Duncan, revised its price schedule sharply downward for three fields.

The cuts ranged from 2 cents for 35°-35.9° oil to 79 cents for oil with a gravity of 15° or lower. Fields affected are Tatums, Tussy, and Wildcat Jim in Carter and Garvin counties.

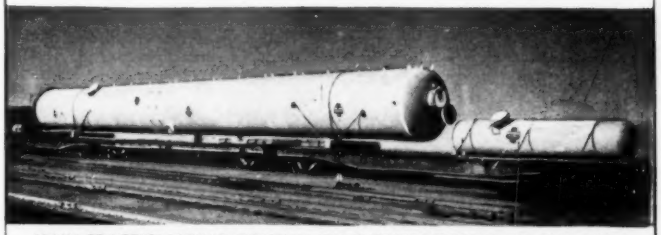
Loss of the company's market for fuel oil was given as the reason for the cut.

STORAGE VESSELS now a production line item at McNamar



45,000 GALLON LP-GAS STORAGE TANK

McNAMAR HAS INCREASED PLANT SPACE BY 30,000 SQ. FEET FOR THE EXCLUSIVE FABRICATION OF STORAGE VESSELS!



MAIN FRACTIONATING COLUMN ON 3 CARS ENROUTE TO CUSTOMER

★ REFINERY TOWERS
★ STORAGE TANKS
★ HEAT EXCHANGERS
★ ACCUMULATORS
★ STRUCTURAL SHAPES
★ MISC. REFINERY VESSELS

● GLAD TO FURNISH QUOTATIONS PROMPTLY ●

McNAMAR BOILER & TANK CO.

REFINERY SALES DIV.
BOX 868
TULSA, OKLA.

Thomas to Seek Reenactment Of Oil-Import Quota Provision

WASHINGTON. — Reenactment of the quota provision originally applied to oil imports in the reciprocal-trade agreements will be sought by Sen. Elmer Thomas of Oklahoma when the bill extending the Reciprocal Trade Act comes up on the Senate floor for consideration.

Just how soon that measure, which now is the unfinished business of the Senate, will be taken up is doubtful because of the illness of Sen. Walter George of Georgia, who will lead the administration's fight to have the law extended without any of the allegedly crippling amendments tacked on by the last Congress.

Would Limit Imports

Thomas announced that his amendment would require the President to impose quotas on the importation of crude and products, limiting imports of all petroleum to an amount not exceeding 5 per cent of our domestic requirements. This provision would automatically be suspended during periods of inadequacy of domestic supplies to meet national requirements. The original quota provisions limited imports at reduced import taxes to 5 per cent annually of the previous year's consumption, and required the payment of full taxes on amounts in excess of quotas.

"Congress must not permit our national safety to be weakened, undermined, or destroyed by the displacement of the oil production of the United States in its own natural markets by importations from abroad," Thomas declared.

"The talents of the many thousands who work in the oil fields and the refineries of the United States must not be destroyed through lack of opportunity to use them. The employment of Americans in this typically American industry is a large element in our economy. Transcending all else in importance, however, is the security of our nation. Increasing dependence for petroleum supplies which are so highly essential to our safety on sources outside the United States, beyond the control of our Government, renders vulnerable the defense program of our nation.

"The oil industry of the United States is now capable of supplying the full requirements of our country. We must not permit it to become so weakened as to render it unable to meet the extreme requirements of a great emergency should one arise."

Brown Says Crude-Oil Imports Are Rising; Wants Congress to Act

WASHINGTON.—Studies of figures now being compiled by the Department of Commerce indicate that crude imports turned sharply upwards last month, after several months of shrinking receipts, it was declared last week by Russell B. Brown, general counsel of the Independent Petroleum Association of America.

Brown said that crude imports, which averaged 474,000 bbl. daily in January and declined in succeeding months to 351,000 in April, averaged 410,000 bbl. daily during the 4 weeks ended May 7.

"Apparently we cannot rely upon the importing companies to voluntarily restrict their shipments of foreign oil to the amounts needed to supplement domestic production," Brown said. "This development has taken place in the face of continuing excessive stocks, particularly of fuel oils, which are the principal products obtained from imported crude."

This situation, Brown told A.P.I. President Fred W. Shield in his weekly report, emphasizes the necessity of securing some action by Congress to protect the domestic industry against heavy imports made possible by the reduction of the import excise taxes under the Reciprocal Trade Act.

However, he pointed out, the bill extending that act contains no safeguards, either as passed by the House or as reported by the Senate finance committee. It is now the unfinished business of the Senate, although it may not be taken up for 2 weeks or more, and the desired protection can be secured only by adoption of an amendment offered from the floor, which later will have to be accepted by the House.

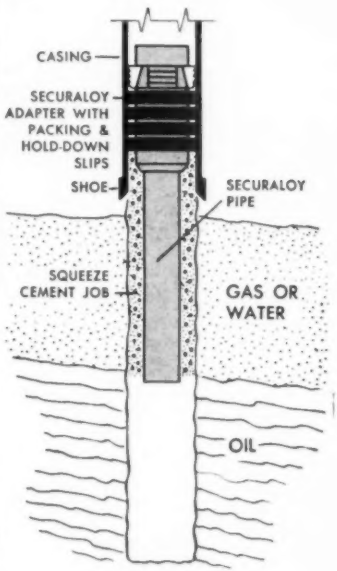
Success of any effort now along this line is doubtful, since the administration is opposed to any provisions which would restrict its authority to tinker with the tariff rates.

USE OF SECURALOY SOLVES MANY PRODUCTION PROBLEMS

Securaloy pipe, which may be removed with chemicals or a drilling bit, is being used to solve many "difficult" production problems, such as correcting gas-oil ratios, water shutoffs and plug backs.

CORRECTING GAS-OIL RATIOS

This method is similar to that used in the case history shown on the opposite page except that the Securaloy pipe extends through the gas zone to the top of the oil zone.



Securaloy set on top of producing zone

This method is used where the entire oil zone can be produced from open hole and where it is not necessary to confine the oil production to selective strata. The hole through the oil zone is first filled with gravel. Securaloy pipe is run and squeeze cemented in position. When the cement has set, Securaloy cementing shoe and gravel are cleaned out and well is ready for production, with gas or water successfully under control.

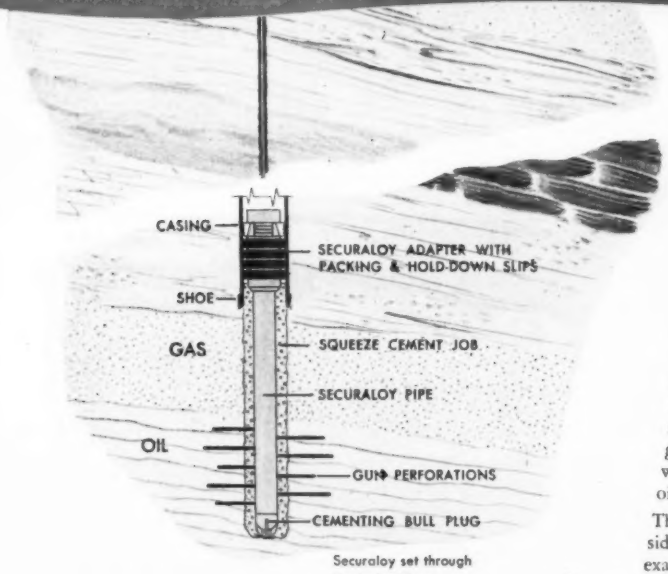
SECURITY ENGINEERING CO., INC.

ONE OF THE DRESSER INDUSTRIES

Main Office and Plant: Whittier, California
Branches in all of the major producing areas
Export Office: Chanin Building, New York City

LOCATION: Texas
GAS-OIL RATIO: 300 to 1
PRODUCTION: 5-6 barrels per day on pump
QUESTION: How to increase production and lower gas-oil ratio by a simple and satisfactory remedial method

Too much gas—Too little oil?



Securaloy set through Producing Zone

When a Texas operator found his gas-oil ratio too high and production way down he determined that the positive way to correct this situation was to use Securaloy. You, too, can profit by using Securaloy to solve your gas-oil ratio problems.

This operator first tried a plastic squeeze job, but the well still made only 6 barrels per day. Then a cement squeeze job was performed, with the entire open hole left full of cement and then drilled out. This proved unsuccessful too!

Finally, the operator cemented Securaloy pipe through the gas-oil sands, as shown. Selective strata were gun perforated and acidized. The well was then completed for 80 barrels of oil per day with a 40 to 1 gas-oil ratio!

This same remedial method is now considered standard practice . . . Another example of the application of Securaloy to solve your production problems.

Security

ROCK BITS • CORING BITS • HOLE OPENERS • REAMERS • CASING SCRAPERS

Securaloy

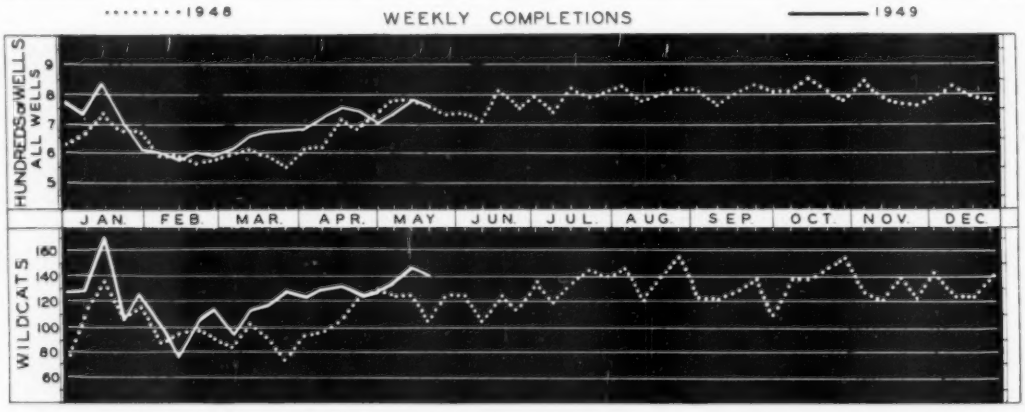
PRODUCTION EQUIPMENT

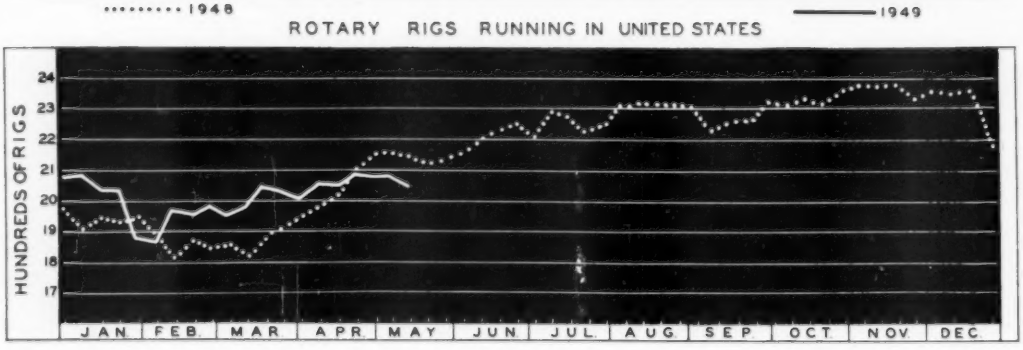
SECURITY ENGINEERING CO., INC.
ONE OF THE DRESSER INDUSTRIES
Main Office and Plant: Whittier, California
Branches in all of the major producing areas
Export Office: Chanin Building, New York City

WEEKLY WELL COMPLETIONS . . . . WEEK ENDED MAY 21, 1949

	Total of all wells					20 wk.		Wildcat completions and discoveries									
													Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	20	10	0	*10	21,058	469	587	0	0	0	0	0	0	0	0	0	0
Pennsylvania	26	10	4	†12	44,321	666	1,010	0	0	0	0	0	0	0	1	1	2
West Virginia	9	1	8	0	26,407	192	287	0	0	0	0	0	0	0	4	5	9
Ohio	24	10	4	‡10	53,688	410	478	0	0	0	2	2	1	0	2	18	21
Indiana	31	20	0	11	62,594	427	346	0	0	0	5	5	6	0	0	84	90
Kentucky	18	9	6	3	34,517	322	232	0	0	0	1	1	4	0	0	15	19
Illinois	49	28	0	21	125,636	773	712	0	0	0	6	6	12	0	0	133	145
Michigan	11	4	0	7	27,452	331	225	1	0	0	6	7	15	0	1	120	136
Kansas	68	41	1	26	220,690	1,105	1,033	1	0	0	9	10	21	0	2	138	161
Neb., Mo., Iowa	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	8	8
Oklahoma	85	47	7	31	322,160	1,534	1,458	1	0	0	12	13	57	8	6	215	286
Texas	§291	164	21	106	1,163,253	4,957	4,121	2	3	1	65	71	159	19	44	864	1,086
North Central (Dist. 7-B & 9)	101	44	0	§57	266,051	1,608	1,265	2	0	0	34	36	75	0	7	341	423
West (Dist. 7-C & 8)	84	70	2	12	375,622	1,119	1,104	0	0	1	10	11	22	0	1	81	104
Panhandle (Dist. 10)	24	5	14	5	72,037	405	213	0	0	0	0	0	1	0	0	1	2
Eastern (Dist. 5, 6, & 6-P)	15	7	1	7	88,315	270	186	0	0	0	5	5	1	1	3	52	57
Gulf Coast (Dist. 2 & 3)	35	22	3	‡10	229,192	743	669	0	3	0	6	9	31	13	21	154	219
Southwest (Dist. 1 & 4)	32	16	1	15	132,036	812	684	0	0	0	10	10	29	5	12	235	281
Louisiana	36	24	0	12	231,077	747	732	1	0	0	5	6	19	6	1	72	98
Northern	16	10	0	6	58,318	381	480	0	0	0	3	3	1	0	0	32	33
Southern	20	14	0	6	172,759	366	252	1	0	0	2	3	18	6	1	40	65
Arkansas	7	5	0	2	20,078	112	109	0	0	0	1	1	2	0	0	25	27
Mississippi	10	4	0	6	70,511	142	144	0	0	0	4	4	3	0	1	40	44
Southeastern States	0	0	0	0	0	21	17	0	0	0	0	0	1	0	0	19	20
Montana	2	1	1	0	7,102	77	88	0	0	0	0	0	1	0	1	8	10
Wyoming	13	8	0	5	57,409	215	153	0	0	0	3	3	9	0	0	37	46
Colorado-Utah	2	0	0	2	1,499	48	92	0	0	0	2	2	1	0	0	20	21
New Mexico	9	6	3	0	39,007	210	234	1	0	0	0	1	4	0	0	18	22
California	52	42	0	10	192,981	1,012	1,059	0	0	0	8	8	19	0	2	173	194
Total United States	763	434	55	274	2,721,440	13,782	13,117	7	3	1	129	140	334	33	65	2,013	2,445
Total previous week	788	424	76	288	2,820,737	13,019	12,354	21	2	3	121	147	327	30	64	1,884	2,305
Total May 22, 1948	763	451	54	258	2,688,256			19	2	1	82	104	290	25	102	1,750	2,167

Service wells included: *10, †11, ‡1, §2.





DAILY AVERAGE PRODUCTION FOR WEEK

	May 21 crude oil	B. of M. May demand	May 14 crude oil
Alabama	1,200	1,550	1,200
Arkansas	80,000	87,000	80,250
California	938,200	950,000	939,000
Colorado	65,900	62,000	65,000
Eastern	61,800	60,950	62,100
Florida	1,375	1,450	1,375
Illinois	175,400	165,000	178,100
Indiana	25,400	22,000	22,200
Kansas	296,400	300,000	296,500
Kentucky	24,300	21,000	22,800
Louisiana	501,050	492,000	501,100
North Louisiana	116,450		116,500
South Louisiana	384,600		384,600
Michigan	45,300	46,000	45,100
Mississippi	108,500	120,000	104,000
Montana	26,700	24,000	26,200
Nebraska	300	700	300
New Mexico	129,825	126,000	129,825
Oklahoma	428,750	410,000	429,650
Texas	1,884,600	2,300,000	1,884,600
Dist. 1 (Southwest)	25,690		25,690
Dist. 2 (Southwest)	118,675		118,675
Dist. 4 (Southwest)	184,350		184,350
Dist. 3 (Gulf Coast)	357,210		357,210
Dist. 5 (Eastern)	34,475		34,475
Dist. 6 (Eastern)	83,525		83,525
East Texas Field	247,400		247,400
Dist. 7-C (West)	42,225		42,225
Dist. 8 (West)	520,150		520,150
Dist. 7-B (W. Central)	56,725		56,725
Dist. 9 (N. Central)	125,400		125,400
Dist. 10 (Panhandle)	88,775		88,775
Utah	400	350	400
Wyoming	123,100	130,000	120,450
Total United States	*4,918,500	5,320,000	4,910,150
Change from previous week, up	8,350		

Total production January 1-May 21 †739,551,495 bbl.

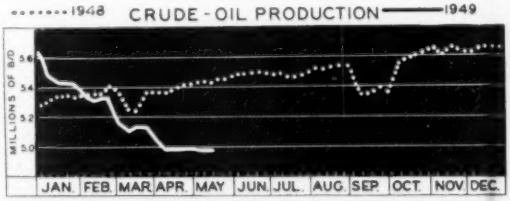
Same period last year (crude plus cond.) 771,463,590 bbl.

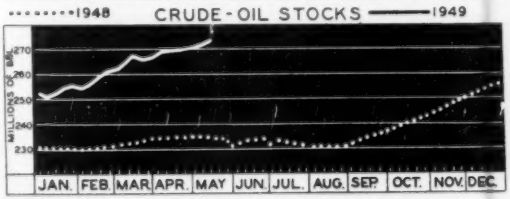
*Not including 83,350 bbl. condensate. †Including 11,976,415 bbl. condensate.

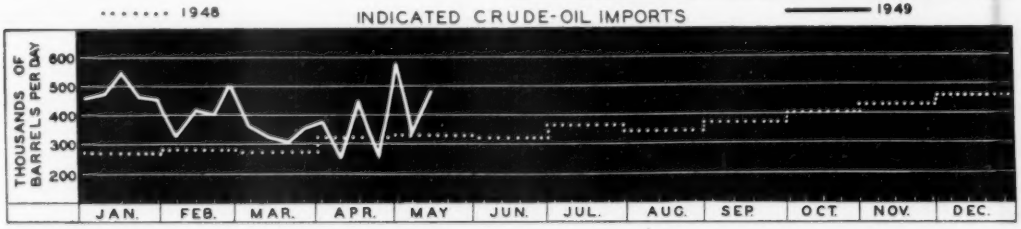
CRUDE STOCKS BY STATES OF ORIGIN

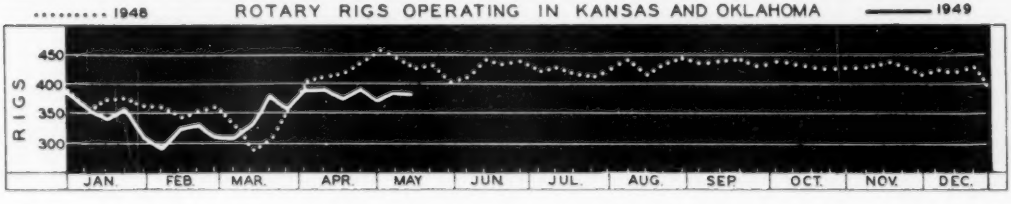
(Thousands of barrels)

State of origin—	May 14, 1949	May 7, 1949	May 15, 1948
Pennsylvania Grade	3,180	3,136	2,585
Other Appalachian	2,097	2,052	860
Ill., Ind., Mich.	14,527	14,546	10,364
Arkansas	3,001	3,148	2,814
Louisiana	13,830	13,932	12,520
North	3,172	3,240	3,112
Gulf	10,658	10,692	9,408
Mississippi	3,148	3,059	2,759
New Mexico	7,898	7,733	6,170
Oklahoma and Kansas	39,733	39,103	32,696
Texas	128,589	128,175	112,640
East	17,805	17,818	16,462
West	50,792	51,286	42,202
Gulf	31,286	30,834	28,936
Other	28,706	28,237	25,040
Rocky Mountain	13,358	13,637	9,156
California	35,492	35,508	23,787
Foreign	9,182	8,566	5,421
Total United States	274,035	272,595	221,772







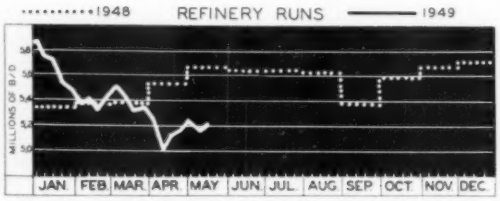


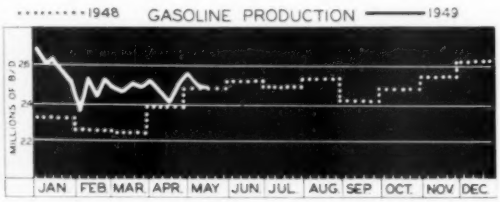
A.P.I. REFINERY REPORT, MAY 14

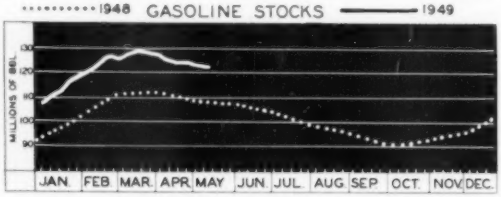
(Thousands of barrels)

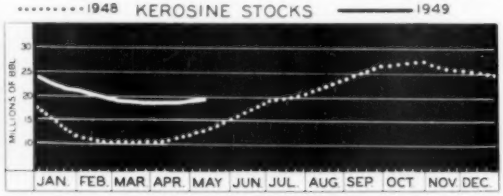
District	Crude runs daily avg.	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, May 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production			
											Gasoline*	Kerosine	Distillate	Residual
East Coast	725	300.7	29.4	149.1	189.0	27,978	8,734	17,966	10,310	895	304.3	47.3	158.8	244.3
Appalachian:														
District 1	96	40.6	5.3	9.3	11.8	2,794	367	627	460	99	40.9	7.9	11.3	11.6
District 2	69	28.0	3.3	4.9	14.3	1,207	146	216	334	68	33.8	2.9	6.7	15.7
Ind., Ill., Ky.	926	483.9	52.7	116.8	143.1	27,567	3,021	8,077	5,263	899	449.8	58.5	116.9	166.5
Okla., Kans., Mo.	398	212.0	17.1	81.7	64.3	12,238	1,038	3,525	2,294	453	223.8	25.0	82.7	73.2
Inland Texas	206	137.7	10.1	17.6	45.0	4,771	414	693	1,073	247	159.8	14.7	24.3	59.9
Texas Gulf Coast	1,204	614.1	68.9	205.3	244.3	18,186	2,773	9,034	8,198	1,436	629.8	97.3	306.6	273.7
La. Gulf Coast	437	229.0	36.3	93.4	48.9	5,953	1,996	3,109	2,159	437	190.1	43.7	94.4	73.3
N. La. and Ark.	77	28.1	5.3	15.3	17.7	2,390	391	895	185	77	27.1	7.5	13.9	18.0
Rocky Mountain:														
New Mexico	11	6.1		1.6	3.6	90	25	47	35	13	6.8	0.4	1.9	3.5
Other Rocky Mtn.	156	66.4	5.0	27.6	37.6	3,376	293	1,161	983	147	68.2	4.3	24.7	33.4
California	911	354.2	10.3	109.0	397.4	15,521	552	7,126	30,699	897	351.1	12.2	150.2	340.8
May 14, 1949‡	5,216	2,500.8	243.7	831.6	1,217.0	122,071	19,750	52,476	61,993	5,668	2,485.5	321.7	992.4	1,313.9
May 7, 1949	5,172	2,504.3	261.6	850.7	1,127.9	123,400	19,178	51,373	61,024					

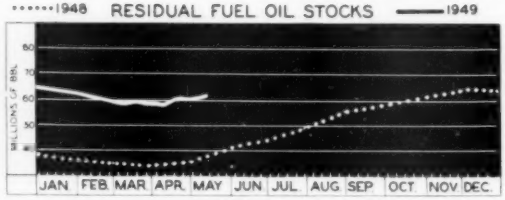
*At refineries including natural blended. †Finished and unfinished. ‡Comparable data for 1948 on new basis not available.

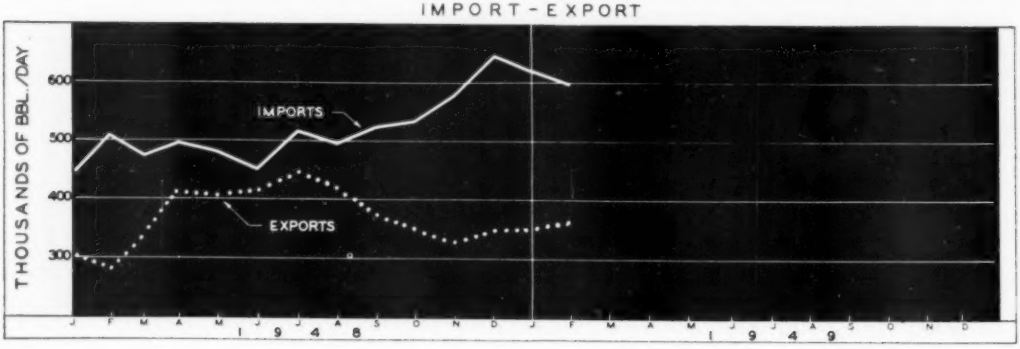












CRUDE PRICES GRAVITY SCHEDULE

Gravity	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.96			
19-19.9	2.07			
20-20.9	2.17	$2.25		$2.12
21-21.9	2.23	2.27		2.14
22-22.9	2.27	2.29		2.16
23-23.9	2.30	2.31		2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas*	$2.65
Kettleman Hills, California*	2.54
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.27
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37-37.9°. †35° and above.

SINCE the middle of last year changes in market prices for petroleum products have had a decided effect on the refinery realization from a barrel of crude. A chart has been added at the bottom of this page giving a comparative picture of changes in the price of a given Mid-Continent crude and trends in refinery realization for the Mid-Continent area.

Refinery realization is calculated from average yields in the Oklahoma-Kansas district and includes both large and small refineries as well as operations using crudes of different types and gravities. Since some refiners do not produce finished lubricants and specialty products, only the changes in yields of the four major products are considered.

The product prices used are the averages of Group 3 quotations as published in The Oil and Gas Journal. All production other than the four major products is included at the price of heavy fuel. Since the chart was designed to show only relative changes and not actual profits, no attempt has been made to separate gasoline production by grades. Therefore all gasoline has been valued at regular grade quotation for the calculations.

Changes in total realization result from changes in product prices and shifts in refinery yields or a combination of both. Some of the slight declines in the early months of 1948 were due to relatively low yields of gasoline and the rapid drops in the last half of the year would have been even more severe except for good gasoline yields.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of May 23, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9½-9¾	11.25-12	9¼-10
Premium gasoline, 78-80 octane	10¼-10⅞	12.25-13	10¼-11
42-44 w.w. kerosine	8-8½	8-8.4	7.50-8
No. 2 straw fuel oil	6¾-7	7.0-7.4	6⅜-6½
No. 6 residual	$0.90-1.00	$1.60	$1.15-1.25

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5¼	4¾	5
Grade 18-55	6.3	5.7	6.0

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11
750 vis., No. 3-4 neutral	14
2,000 No. 5-6 neutral	16-16.5

LUBRICATING OILS
Mid-Continent

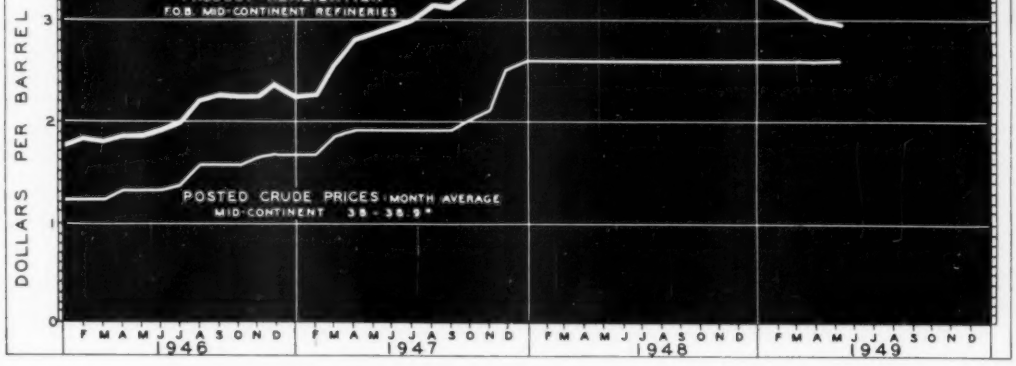
150-160 vis., D bright stock, 0-10 pp.	18
200 vis., No. 3 neutral, 0-10 pp.	14

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	21.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.75



The above chart is based on posted price for 38°-gravity crude and representative refinery yields which are confined to gasoline, kerosine, distillate, and residual fuel oil. Refinery prices used are the average of Group 3 quotations as published in The Oil and Gas Journal

EQUIPMENT MEN . . . in the News

Johnston Made District Sales Manager for Brown

L. C. JOHNSTON

John W. Brown, Jr., president of Brown Fintube Co., has announced the appointment of Laurence C. Johnston as district sales manager with headquarters in New York City. Johnston has been engaged in the heat-transfer field for 15 years, and brings valuable experience to the company.

Prior to his new association, he was eastern district manager for Process Engineering, Inc., and also chief engineer of Patterson-Kelley Co., Inc. Johnston is a graduate of University of Michigan, having received a degree of mechanical engineering in 1930.

Dr. Hanford Elected Vice President of Kellogg Co.

DR. HANFORD

The increasing importance of the development work of M. W. Kellogg Co. was indicated when H. R. Austin, president, announced that Dr. W. E. Hanford, director of petroleum and chemical research, had been elected a vice president of the company.

Dr. Hanford, who has been nationally prominent in many fields of research, joined the Kellogg organization in 1946, going to that company from General Aniline & Film Corp., where he was director of research. He was appointed to the newly created post of director of petroleum and chemical research at Kellogg in 1948.

Skyrm Elected General American Vice President

At the annual meeting of General American Transportation Corp., Sam Laud, president, announced the election of Harold D. Skyrm as vice president.

Skyrm, who has been associated with General American for many years in several capacities, was recently made head of the process equipment, plate and welding, and Wiggins vapor seals divisions, with offices in Chicago.

Davis Made Supervisor by Southern Geophysical Co.

R. E. Davis, Southern Geophysical Co., Fort Worth, has been promoted from party chief to West Texas supervisor of the company, Dr. Sidon Harris, president, has announced.

Now stationed in Tahoka, Tex., he will supervise several Southern Geophysical crews now operating in West Texas.

Davis has been with Southern ever since the company was organized 4 years ago and previously was with Stanolind Oil & Gas Co. for 10 years.

B. & W. Buys Houston Plant

B. & W., Inc., manufacturers of wall-cleaning guides, rotating scratchers, and latch-on centralizers have recently announced the purchase of a plant and warehouse at 1010 Fennel Street, in Houston. B. & W. has moved its Houston headquarters from the M & M Building to the new location.

Boyle & Woodard Announce New Pelton Hydraulic Jack

W. F. Boyle, vice president and general manager, and C. J. Woodard, manager of sales and service, hydraulic pumping-jack department, Pelton Water Wheel Co., held an informal press conference recently at the Biltmore Hotel in Los Angeles to announce production of a new heavy-duty series "C-P" long-stroke, hydraulic pumping jack.

All the Pelton personnel were present for the review and discussion on the new addition to line of pumping jacks already manufactured by the company.

W. F. BOYLE C. J. WOODARD

Oilwell Announces Several Promotions

D. S. GRUBBS

W. F. PARKER

Donald S. Grubbs has been named manager of the California division of Oil Well Supply Co., U. S. Steel subsidiary, Lloyd Tracy, vice president, has announced. The division is being expanded to provide for both a division manager and a sales manager and Grubbs will be in charge of this important territorial division of the company.

Warner F. Parker, long identified in California sales for the company, assumes the newly established position of sales manager in the division. Both Grubbs and Parker will headquarter at Los Angeles.

E. E. Branson, warehouse supervisor at Columbus, Ohio, for Oilwell, has been transferred to Charleston, W. Va., as assistant district material supervisor of the Ohio-West Virginia district. He will be succeeded at Columbus by F. B. Lane, formerly associated with the Newark and Wooster, Ohio, stores.

Three appointments in Oilwell's eastern division have been announced. Seymour L. Brown, manager of the Mount Pleasant, Mich., branch store, has been named district material supervisor of the Michigan district and will continue to make his headquarters at Mount Pleasant. He will be succeeded as store manager at Mount Pleasant by William F. Corbin who has been associated with the Mount Pleasant store since 1941.

Carl R. Nelson has become assistant district material supervisor of the Pennsylvania district and will headquarter at Bradford, Pa. He is being transferred to Bradford from the store at Washington, Pa.

George A. Hays, Jr., Tulsa, has been named director of market development for Oilwell with headquarters in Tulsa. Dr. Frank Kogel, specialist on diesel and combustion engines, has been appointed division chief engineer for Oilwell's Witte Engine Works division at Kansas City, Mo.

Catts to Head Eggelhof's Corpus Christi Office

Gordon R. Catts, Jr., has been appointed sales engineer by Eggelhof Engineers to cover South Texas with headquarters in Corpus Christi. This new office will enable Eggelhof, as the representative of manufacturers of boilers, power-plant equipment, and industrial controls, better to serve the increasing number of industrial and process plants along the Gulf Coast and in the Rio Grande Valley.

With general offices in Dallas and Houston, and division offices in San Antonio, Lubbock, New Orleans, and Shreveport, the addition of the Corpus Christi office completes a program of expanding the engineering sales coverage over Arkansas, Louisiana, and Texas. It is anticipated that a division office for Oklahoma, probably in Tulsa, will soon be announced.

Berleth Made Assistant Chief Engineer at Hughes

Daniel J. Martin, vice president, engineering, Hughes Tool Co., has recently announced the promotion of F. H. Berleth to the position of assistant chief engineer. Berleth will serve as general assistant to L. E. Garfield, chief engineer of the company.

Berleth joined Hughes in 1917 as a part-time employe while attending Rice Institute. At the time of his promotion he was manager of the design and drafting division of the product engineering department.

Hoover Directs Amarillo Office for Crane Packing

Crane Packing Co. has opened an office in Amarillo, Tex., with F. W. Hoover in charge. Prior to his employment in 1948 by Crane Packing Co., Hoover was associated with Pure Oil Co., Kerr Lynn Oil Co., and E. I. du Pont de Nemours & Co., Inc. He attended Oklahoma University.

Harold Bottomley Made Vice President

Harold Bottomley, formerly chief process engineer for Refinery Engineering Co. of Tulsa, has recently been appointed a vice president of the company, according to T. M. Lumly, president.

Bottomley joined the company in 1947. In his new position he will devote a greater portion of his efforts to contacting the company's clients.

Hutchcraft to Represent Several Manufacturers

D. B. Hutchcraft has formed D. B. Hutchcraft Co. with headquarters at 1222 South Xanthus, Tulsa, and will represent several leading manufacturers in the Mid-Continent area including Burgess-Manning Co., Continental Air Filters, Inc., Dresser Manufacturing Division, Pennsylvania Pump & Compressor Co., Roots-Connersville Blower Corp., and Liquidometer Corp.

Bellicard Goes to Mexico

J. C. Bellicard, chief engineer for the Houston electrical production department of Schlumberger Well Surveying Corp., has been transferred to Mexico where he will take charge of Schlumberger Surenco's Mexico City office. Bellicard will act as technical adviser to Pemex.

Federal Radio & Telephone Appoints Perry and Butler

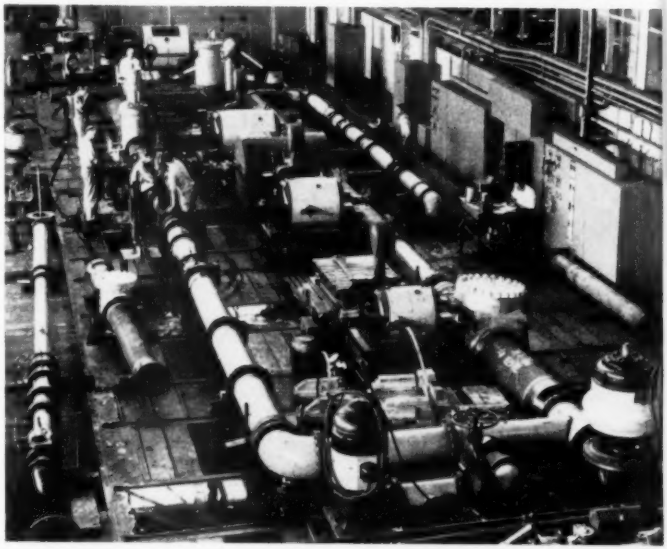
Raymond S. Perry, formerly president of Eicor Corp., Chicago, and previously in charge of sales and engineering of several of the country's large industrial organizations, has been appointed general sales manager of Federal Telephone & Radio Corp.

R. S. PERRY

E. W. BUTLER

Announcement has also been made of the appointment of Edward W. Butler to the position of director of the radio division of the company. Butler, who has resigned his position as general manager of the electronics division, Sylvania Electric Products, Inc., will devote his attentions to the company's line of broadcast and communications equipment, including transmitters and associated items such as mobile radio telephone and telephone and telegraph carrier systems.

Byron Jackson's Hydraulic Pump Testing Laboratory



Testing one of the valves for the 30 and 31-in. Trans-Arabia pipe line in the new half-million-dollar hydraulic-pump testing laboratory recently completed by Byron Jackson Co. at its Vernon plant at Los Angeles. Primarily used to certify Byron Jackson specialized pumping equipment, the laboratory has been open to such societies as American Society of Mechanical Engineers and to professors and classes of undergraduate engineering schools

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: Near Wynona, Oklahoma, 32'x96'x10' Sectional Steel Corrugated Iron Building now erected. $1500.00. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FRANKS double drum model 5000 spudder, excellent condition. Mast, lines, tools, dog house, light plant, butane tank. Complete and ready to go. Gleason Drilling Co., Russell, Kansas.

FOR SALE: At Houston 27 miles 6" 12.98# DRL used Line Pipe beveled. All or any part. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: 100 hp. Allis-Chalmers electric motor, explosion proof, slip ring, new unused 3 hp., 500 v., 50 cy., 585 rpm., or 550 v., 60 cy., 700 rpm. $1800.00 f.o.b., Portland, Ore. A. Eckley, 1709 24th Ave., Longview, Wash.

USED PUMPING EQUIPMENT & PIPE
1—Buda Engine Model JK4 to Gaso Pump 2½" x 5" x 10"
1—Buda Engine JK4 to Wheatley Pump 8" x 10"
1—Waukesha Engine CRS6 to Allis-Chalmers 15 KW-DC generator with starting equipment
115,000 ft. 6⅝" OD 17.9# Seamless, Range 3, P.E.
80,000 ft. 4½" OD 8.64# Seamless, Range 3, P.E.
50,000 ft. 6⅝" OD 19.45# T&C, Lapweld
All A-1 Condition
W. C. BERRY
P.O. Box 1858, Tulsa, Okla., Phone: 3-6141

EQUIPMENT FOR SALE

FOR SALE: Model "K" Cardwell, single drum draw works powered by G.A.K. Waukesha engine. Equipped with 98' "A" mast and sub skid. Priced for quick sale. Terms. Melton Supply Co., Seminole, Okla.

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000' —Respooled for Your Inspection — Cable Tools for Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

FOR SALE: 2 Cyl. 2 Cyc. 100 HP Superior horizontal direct connected engine-compressor unit complete. Plant shut down due to shortage of gas. Pollard & Davis, Fort Stockton, Texas.

★ ★ SURPLUS ★ ★

HUGHES TRI-CONE ROCK BITS

OIL WELL TOOLS

Our purchase of a Government oversupply allows us to offer a small number in excess of our immediate requirements of these standard Hughes rock bits, on an outright sale basis far below the fixed rental price.

15" Hughes Tri-Cone Rotary Rock Bits, Type OSC-2	$237.00 ea.
Reed Rotary Reamers—Single 3 Point Complete with Cutters—	
10½" to 10⅞"	$451.50 ea.
14⅝" to 15½"	$680.00 ea.
Dunlap Three Wing Drag Bits for 6⅝" Pin—	
8⅝"	$61.50 ea.
10⅝"	$74.10 ea.

ALL TOOLS ARE NEW AND IN THE ORIGINAL EXPORT CRATES

Limited quantity makes all orders subject to prior sale. Orders will be given priority as received.

MOORE & HANKS' COMPANY
2632 Humboldt Street
Los Angeles, 31, Calif.
Capital 1-9144

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: 1 new patented Tom Dietle all steel, heavy duty casing pulling machine, 10" x 55' "A" mast—Double Drum—Double brake spudding attachment for ripping casing. I.H.C. motor, fully equipped, starter, 4-speed power transmission, also tools. Located Eureka, Kansas, Phone 1032, 917 North Elm or Tulsa: 2136 So. Yorktown, Phone 2-0061.

MODEL 53 Keystone well drill mounted on 1946 Ford tandem drive truck. Excellent condition throughout. Sacrifice price. R. B. McElwaine, Box 127, Little Rock, Ark.

FOR SALE: Wilson Giant draw works, powered by 2—J L.-1335 Buda engines and Wilson chain compound. Like new condition, with bargain price. Terms. Melton Supply Co., Seminole, Okla.

ONE Army surplus Buda M. O. 893, six cylinder engine with skid complete, $1,750.00 F.O.B. Houston, W. H. Orr, A 8-6064; #15 Japhet Street, Houston 10, Texas.

FOR SALE—Franks Model FA with automatic chuck, complete with watertruck and all equipment. Mounted on late 2-ton trucks. Due to other interest will sell very reasonable. Box C-913, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Wilson Super Spudder—Double drum, double pole mast, complete with walk ways, roof, wings, and fully skidded—Good Wire—Priced to sell. Wilson Mogul Drawworks, powered by 145 GK Waukesha—Portable derrick—Wilson Snyder 6 x 16 pump, powered by WAK Waukesha—4½" Drill Pipe, Traveling Block, Swivel, 4¼" x 40' Kelly, BJ Tongs, etc.—Priced to sell. Write: T & R Oil Field Machine & Supply Co., Box 98, Carmi, Ill.

WANT to sell or trade for smaller rig preferably 3500 to 4000 ft. one Unit No. 15 with 3 WAKU motors, 127' jacknife mast, hydramatic brake, 5500' 4¼ drill pipe. New in November, drilled 17,000' hole, everything ready to run, located in Kansas, might consider selling an interest. P. O. Box 1979, Wichita, Kansas.

FOR SALE: One 55 ft. Steel Telescope heavily reinforced Rig Pole with Bucyrus Head. Brand New. Priced Cheap. Neosho Drilling Co., P.O. Box 265, Chanute, Kansas.

FOR SALE: Fifty, Sixty, and Eighty Thousand barrel tanks, good condition, knocked down or erected on your locations at attractive prices. Atlas Tank & Steel Company, Tulsa, Oklahoma.

ROTARY equipment, almost new, only used few days, 1800' PK rods, Drill collar 30'x4¼" with 3½" box, King water swivel 1¼", PK slips, hoisting plugs, overshot. Complete outfit $4500, or will divide. We handle new and used spudders, rotaries, core drills, pipe, tools, cable. Fishing tools and equipment rented. Pressey & Son, Pueblo, Colo.

FOR SALE: Sullivan #200, 1945 model, mounted on 1941 White truck. Rig in excellent condition, but drill pipe poor. Sale price $13,000. Phone 377-W, 932 Edwards, Midland, Texas.

SOME MORE PIPE FOR SALE!

8⅝" OD 24 lb. Used Lap Weld Casing T & C
7" OD 20 lb. Used Lap Weld Casing T & C
7" OD 17 lb. Used Lap Welding Casing T & C
5½" OD 15 lb. Used Lap Weld Casing T & C
5½" OD 13 lb. Used Lap Weld Casing T & C
2⅜" OD 4.60 lb. Upset Lap Weld Tubing
2" Regular Used Lap Weld Line Pipe

AVAILABLE FOR IMMEDIATE SHIPMENT

*Located in Charleston, W. Va., area. *All in A-1 Condition.

For complete information and prices contact the following:

OKMULGEE SUPPLY CORPORATION
Okmulgee, Oklahoma

RIGHTWAY PIPE & SUPPLY CO.
Alice, Texas

SAN ANTONIO PIPE & SUPPLY CO.
1735 South Alamo St.
San Antonio, Texas

MAX G. WEINER CO.
1401 Centennial St.
McKeesport, Pa.

FOR SALE

One (1) new fractionating tower, 5'-0" I.D. X 89'-6" over-all height X 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18"-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5'-6" I.D. X 18'-6" over-all length x 1⅛" plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis St. Wichita, Kansas
Phone 7-3325

EQUIPMENT FOR SALE

FOR SALE: 10,000 ft. 20" OD x ¼" Wall New Electric Weld Steel Pipe, Double Random Lengths; 50,000 ft. 18" OD x ¼" Wall Used Steel Pipe, Single Random Lengths. Utility & Industrial Supply Company, 921 Michigan Ave., E., Jackson, Michigan.

DRILLING RIG: Nearly new 71-Speed Star mounted on late model Dodge truck; completely equipped, tools, lines, light plant, tool house, water tank on trailer. Price $6,500. D. M. Lincicome, Moran, Kansas. Phone 5-F-3.

SPECIAL OFFER! Truck mounted portable rotary drilling rig, detailed information upon request. Priced for quick sale. Mechanical Equipment Co., 861 Carondelet Street, New Orleans, La.

FOR SALE: 6 Fairbanks-Morse ZC-118 engines, all in first-class condition. Lahoma Oil Corporation, 619 Leonhardt Building, Phone 7-1211, Oklahoma City.

BUCYRUS-ERIE 36L Spudder—A-1 condition. Will sell with or without complete set of tools, including complete set of casing tools. L. H. Bebout, Route 3, Newark, Ohio.

FOR SALE: Insley K-12 Back hoe, same as new, only five months old. If interested call: Paul Haines, Jacksboro, Texas, Phone 8 or at Marion, Kansas, 478-J.

NEW CENTRIFUGAL PUMPS
Byron Jackson—Aurora—Lombard—Gould—Hale—Gorman Rupp—Wayne & Novo, complete with engine power, also 1½ to 20 KW light plants. H. A. McCarthy, 310 Thompson Building, Tulsa, Oklahoma.

MANUFACTURERS LATEST DESIGN
Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.
OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

PACKAGED H_2S REMOVAL UNITS
We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.
GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

FOR SALE
12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.
ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

TANKS—TANK CARS
NEW LOW PRICES
2—74,000 Bbl. Steel Tanks, Like New
2—10,000, 3—1,000 and 3—65 Bbl. API New Bolted Tanks
80—8,000 and 10,000 Gal. Cap. Tank Cars
THE DARIEN CORPORATION
60 E. 42nd St. N.Y. 17, N.Y.

FOR SALE
NEW CASING AND LINE PIPE
25,000' 5½" 15½# 8RT J55 R2 API Smls. Casing
15,000' 7" 23# 8RT J55 R2 API Smls. Casing
8,000' 8⅝" 28# 8RT J55 R2 API Smls. Casing
4,841' 9⅝" 36# 8RT J55 R2 API Smls. Casing
7,015' 10¾" 40½# 8RT J55 R2 API Smls. Casing
19,000' (593 Joints) 6" Std. Byer's Wrought Iron L.W. Plain End Pipe (ASTM A72-33)
Above subject to prior sale.
THE NATIONAL COOPERATIVE REFINERY ASSOCIATION
P.O. Box 770 McPherson, Kansas
Phone 820

EQUIPMENT FOR SALE

FOR SALE: 11-24" Merco Fig. 4449 Plug Valves, New. Michigan Gas Storage Company, P.O. Box 729, Jackson, Mich.

FOR SALE: Range 1, used Lapweld Casing, Sizes 4" to 10", also a large amount of Tubing and Line Pipe. Location: West Virginia. Pipe Pulling & Plugging Company, Box 213, Charleston, West Virginia.

CASING AND LINE PIPE END USERS
If interested please state wants. W. F. Plagenz, 502 Park Bldg., Cleveland 14, Ohio.

2—Allis-Chalmers HD19 tractors; Caterpillar D82U352 Hydraulic dozer; Brand New Caterpillar D7. Miller, 335 Southwest Blvd., Victor 6312. Kansas City, Missouri.

10—35,000 bbl. steel storage tanks, shell and bottom, cut down, ready to load, Stoy, Illinois. Price $5,000.00 each.
W. C. BERRY
P.O. Box 1858, Tulsa, Okla., Phone: 3-6141

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.
H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

FOR SALE—STEEL STORAGE TANKS
7—55,000 bbl., Maud, Oklahoma
15—80,000 bbl., Hominy, Oklahoma
11—55,000 bbl., Mexia, Texas
27—80,000 bbl., Mexia, Texas
For further information, write
STANOLIND OIL PURCHASING CO.
Atten: L. M. Jones, Box 591, Tulsa, Okla.

EQUIPMENT WANTED

WELL-KNOWN drilling company needs rotary drilling skid unit—6,000'. Must be in good shape and not too old. Mail inventory and full particulars. P.O. Box 26, Tulsa, Oklahoma.

WANTED—Failing model 44, 1500, 1000, or 55. Other make of similar capacity. Fred E. Butler, 1013 So. Cedar, Casper, Wyo.

HELP WANTED

MATERIALS ENGINEER—Experience in listing, expediting, and storehouse control of material, with oil refinery maintenance or construction background. Write, giving training, experience, references and personal details to: P. O. Box 2094, Billings, Montana.

WELDING and Boilermaker Foreman—Must have experience in these trades and in supervising. Oil refinery experience preferred. Write, giving training, experience, references and personal details to: P. O. Box 2094, Billings, Montana.

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

PURCHASING AGENT: Familiarity with refining equipment and specifications. Write, giving training, experience, references and personal details to: P.O. Box 2094, Billings, Montana.

WANTED: Experienced oil field equipment salesman with practical experience background on spudders and cable tools for sales position with nationally known oil field equipment manufacturer. Box C-904, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED—Oil Treating Engineer to organize and conduct treating program, for major oil company, production operations, with main offices in Oklahoma City. Should have adequate production background and previous treating experience. Write giving detailed experience, education, references, salary requirements, age, and personal details. Replies confidential. Box C-914, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW Directory of 140 large oil companies in U.S. 10 of them having foreign operations, showing where to apply for jobs. Price $5.00 postpaid. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (our 29th year).

MANUFACTURER'S REPRESENTATIVE wanted to sell oil field drilling equipment in the Gulf Coast area. Write Box C-906, The Oil and Gas Journal, Tulsa, Oklahoma, giving complete information including present lines and references.

WANTED: Experienced salesman to call on the oil country trade to solicit electrical business. Prefer married man 30 to 35 years old, M.E. or E.E. graduate or equivalent experience. This is an opportunity for a man who is willing to work, salary commensurate with ability, plus bonus and expenses. Please reply to Box C-903, The Oil and Gas Journal, Tulsa, Oklahoma.

Established reliable industrial plant Engineering and Construction firm in Houston, Texas, wishes to license the engineering and or construction of processes in the Chemical, Petro Chemical or Petroleum industry in the Gulf Coast and Southwest industrial areas. Box C-921, The Oil and Gas Journal, Tulsa, Oklahoma.

ANNOUNCEMENT OF STAFF POSITIONS
PETROLEUM ENGINEERING DEPARTMENT
UNIVERSITY OF OKLAHOMA

The following are permanent staff appointments. Salaries will depend upon training and experience.

(1) **Professor of Petroleum Engineering**—Advanced degree in petroleum engineering or a fundamental science preferred. Experience in reservoir work, evaluation, or research problems. Undergraduate and graduate instruction and supervision of graduate students. 9 months. Appointment September 1.

(2) **Associate or Assistant Professor of Petroleum Engineering**—Advanced degree preferred. Experience in production, drilling, or other phases of petroleum engineering. Undergraduate and graduate instruction. 9 months. Appointment September 1.

(3) **Instructor of Petroleum Engineering**—Training and experience in any phase of petroleum engineering. Undergraduate instruction. 9 months. Appointment September 1.

(4) **Research Engineer**—M.S. degree minimum. Top supervision of A.P.I. Research Project 47B. 12 months. Appointment July 1.

The following temporary part time appointments are for graduate students. Stipend is fixed.

(1) **Graduate Assistant**—Half time devoted to departmental duties such as laboratory supervision. Enrollment as a graduate student with 10 to 12 hours course work per semester. Stipend $810.00 for 9 months.

(2) **Research Assistant**—Half time devoted to research on A.P.I. Project 47 B. Enrollment as graduate student with 10 to 12 hours per semester of course work. Stipend $1,500 per year.

Interested persons reply to School of Petroleum Engineering, University of Oklahoma, Attention: Dr. John C. Calhoun, Jr. Give full details of training and experience, salary expected and references.

SITUATIONS WANTED

SALES REPRESENTATIVE: 40 years old. Graduate Petroleum Engineer. Good record of achievement. Well known to Oil Circles on the Gulf Coast and in Southwest Texas. 15 years experience engineering and managing Sales direct and through distributors to the Production, Drilling, Pipe Line and Natural Gas and Gasoline Industries. Live in San Antonio prefer to headquarter there and work Southwest Texas. Available immediately. Can furnish top flight references. Box C-922, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER: Six years thorough experience in reservoir engineering, valuation, well completion, and production operations. Excellent scholastic record. Desire responsible position with progressive company. Presently employed. Box C-919, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE desires affiliation with a major oil company. Graduate Chemist, M.S. Petroleum Engineering, 20 years experience, 18 years gasoline testing lab. manager. Qualified for: Public Relations, Sales Promotion, Employee Training, Advertising Layout and Aptitudes. Box C-925, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN—Ten years Kansas and Oklahoma experience in independent producer's district office. Working knowledge of office procedure and accounting. Good references. Box C-926, The Oil and Gas Journal, Tulsa, Oklahoma.

SENIOR PETROLEUM ENGINEER: Now in semi-executive position major oil company with wide experience in all phases petroleum engineering, geology, well completions, and supervisor of field operations. Age 38. Desires opportunity with smaller producing company. Record on request. Box C-927, The Oil and Gas Journal, Tulsa, Oklahoma.

COLLEGE GRADUATE, age 33, experienced production and drilling. Experience as crude buyer. Now employed wholesale refinery sales. Earnings over $6,000 annually. Desire return to Mid-Continent area about June 15. Legal background. Box C-928, The Oil and Gas Journal, Tulsa, Oklahoma.

COMPETENT PETROLEUM GEOLOGIST with years of experience in: Geology, Geophysics, oil and gas production, land and title work, obtaining easements, valuation work, and General Business Management wants responsible position with independent oil producer or small oil company. Personal data: 40 years old, married, perfect health, no physical defects, 6 years Latin American experience, degrees in Geology from Univ. of Tex. and Univ. of Calif. Registered Professional Engineer for Texas. GEOLOGIST, 504 N. Fannin Ave., Cameron, Texas.

PETROLEUM Engineer: 7 yrs. experience drilling and production, Mid-Continent and Gulf Coast, past 2 yrs. in supervisory capacity desires position with an active oil company. Box C-911, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST: B.S. with seven years' experience in Gulf Coast and Venezuela. Desires domestic position. Age 31, married. Box C-907, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVE PURCHASING AGENT

Age 42, with 15 years petroleum refining and production equipment fabrication experience.

- Knows oilfield production equipment.
- Knows inventory control, and cost cutting practices.
- Wide acquaintance with oil country and steel mill personnel.
- Sociable, good mixer, works closely with sales department.
- Railroad, Industrial and Bank references.
- Freight traffic and accounting background. Good organizer.

Wants larger responsibilities. Presently employed, available on reasonable notice.

Address Box C-923

The Oil and Gas Journal
Tulsa, Oklahoma

SITUATIONS WANTED

INCOME TAX CONSULTANT — Specialized experience in natural resources, pipelines, etc. Available now. Box C-924, The Oil and Gas Journal, Tulsa, Oklahoma.

CONTROLLER-TREASURER
Experience with independent oil company in production, refining, marketing accounting, taxes and finance; presently employed; desire change. Box C-885, The Oil and Gas Journal, Tulsa, Oklahoma.

REFINERY MANAGER: M. S. in Ch. E., age 35, registered Texas engineer, thorough knowledge refining, now manager small Texas refinery. Desire new connection. Available short notice. Box C-930, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED toolpusher and driller in charge of core drill desires permanent position with a growing concern. Have had some experience in shallow production. Will go anywhere. Box C-929, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED

GASOLINE Connection Wanted: Wish to contract for six million gallons a month for 1 year at market price. No brokers. Will deal with principals only. P.O. Box 481, Beaumont, Texas.

FOR SALE

TRUCK LETTERING AND TRADEMARK DECALS made for your trucks and equipment. Easy to apply, uniform, distinctive, economical for small or large needs. Write for catalog. MATHEWS COMPANY, 827 S. Harvey, Oak Park, Illinois.

RANCH TYPE home, new, six bedrooms, quarter-sawed oak, maple floors, Carthage cut stone. Finest construction. Five acres, beautiful view. Ideal for professional man. Suburbs Kansas City, Kansas. All information and picture sent on request. Z. Kvaternik, 402 North Fifth Street, Kansas City, Kansas. DR 9878.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

SERVICES

RADAR Surveys: Latest mobile radar equipment installed in Jeep and modified for oil exploration. Locates and outlines areas of possible oil saturation. Defines faults. For further information write Geotronic Laboratories, 335 So. Sycamore St., Centralia, Illinois.

PECOS DRILLING COMPANY, INC.
DRILLING CONTRACTORS "Cable Tools"
302 CARPER BUILDING, TELEPHONE 649
ARTESIA, NEW MEXICO

MANUFACTURER WANTED

INVENTOR has new flowing device for Oil Wells designed to preserve gas. Manufacturer needed on Royalty basis. John Turmes, 3824 Rusty Dell, Fort Worth, Texas.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

BUSINESS OPPORTUNITIES

SMALL BUSINESS (net assets of $250,000 to $500,000), net earnings from $10,000 to $25,000 per annum, with competent and good management can be assisted in finding new working capital by distribution of securities. Confidential correspondence invited. No advance fees asked. Reply FINDER SERVICE, Room 605, No. 109 Broad Street, New York City 4, New York.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

WILL BUY FEE LANDS, producing royalties or mineral prospects. Submit offerings in detail to Box 546, Thibodaux, Louisiana.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

LEASE AND DRILLING BLOCKS

OIL LEASES for sale in large, small or medium size blocks in Colorado, Wyoming, New Mexico, Montana, Arizona. Wholesale or retail. Write for descriptive list. Dyer-OJ, 1835 Champa, Denver, Colorado.

SETTLED Production: Approximately 560 acres, 36 producing wells, approximately 60 bbl. per day, all Bartlesville sand wells. Box C-917, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky.

FOR LEASE for oil and gas—acreage in Brazoria County near Angleton, Texas. Write E. Hufford, Box 633, Boulder City, Nevada.

FOR SALE: Oil and Gas Lease, 1880 acres, Quealy Dome, Albany County, Wyoming. P. O. Box 516, Laramie, Wyoming.

SOUTHEASTERN NEW MEXICO: For Sale—Oil leases and royalties in North Lea and Eastern Chaves Counties. Grant Keyes, 311 White Bldg., Roswell, New Mexico.

MONTGOMERY COUNTY, MISSISSIPPI, on the ideal shoreline structure, where the sands are thicker and much more favorable for petroleum accumulation. 145 acres on SEISMOGRAPH HIGH adjoining Highway and Railroad 31-19-7 on DOME outstanding Kilmichael structure. Four sands to 3,500 feet. If no oil will deed you land. Opportunity: 1369 Court, Memphis, Tennessee.

FOR SALE: 160 Acre lease, 1690 feet from an Arbuckle test now drilling, 740 feet from an Arbuckle well from which several tanks of premium crude have been shipped. Guarantee no dry holes, bottom hole payoff. Write Box 254, Chetopa, Kansas. Phone 66.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY

60 Broadview Drive, Clayton (5), St. Louis, Missouri

NEW MEXICO OIL

OPERATORS, INVESTORS & ROYALTY INVESTMENT BANKERS. Due to our long and extensive engineering experience in oil development in New Mexico we are in a position to serve your best interests in the purchase of leases or royalty either under production or Major Co. operation. We specialize in the famous Cross Road field, and northwest extension operations clear into north Chaves County, under Major Co. development. To those interested in the tremendous oil reserves being developed in the Permian, Pennsylvania and Devonian in these areas we offer our unbiased cooperation.

W. J. PETERMAN, GEOLOGIST
Portales, New Mexico

East Texas

(Continued from page 150)

Carr 46-acre tract in the James Colson Survey. The new drill site is southeast of Jackson and DeuPree 1 Lechner & Padgett, recent Woodbine failure.

Byars & Peveto, Tyler operators, were attempting to shut off water in the 1 A. Tulley, prospective Paluxy well 10 miles north of Mount Vernon in Franklin County. The well has been puming some 400 bbl. of fluid daily, of which about 10 per cent was oil, from perforations at 4,404-48 ft.

In the Cusseta area of Cass County, Humble Oil & Refining Co. 1 Guerin, James Frazier Survey, topped the lower Glen Rose around 6,781 ft. and was coring ahead below 6,894 ft. in shale and lime, with no shows.

Delta Drilling Co. 1 Swindle, Hayden Arnold Survey, between Yantis and Como fields of southern Hopkins County, was drilling below 4,560 ft. Cores from 3,993-4,001 ft. showed salt water, in unidentified formation.

Gulf Oil Corp. 1 Veach, Jacob McFarland Survey, Bowie County, was coring below 10,137 ft. in the Smackover.

In Harrison County, Placid Oil Co. 1 Winston, 3 miles northeast of Lotta, was waiting on cement after plugging back to 5,785 ft. from 8,323 ft.

Humble 1 Thurman Crawford, Simri Bennett Survey, 2 miles west of Linn Flat in Nacogdoches County, was squeezing all perforations, from 6,800-02 and 6,700-02 ft.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) WILDCAT FAILURES

Cherokee County: Wise & Cecker 1 M. W. Armstrong, Tillman Walters Sur., 1½ mi. NW Alto, dry, TD 5,755 ft., Pecan 4,217 ft., Austin chalk 5,055-5,257 ft., Woodbine 5,267 ft., Georgetown 5,700 ft., by samples, elev. 408 ft.

Harrison County: Union Producing Co. 1 Bergin, J. Marshall Sur., 9 mi. NE Beckville, dry, TD 6,730 ft., James lime 5,875-5,990 ft., Pettit 6,147 ft., by samples, elev. 231 ft.

Leon County: General Crude Oil Co. 1 S. L. Smith, Samuel B. Marshall Sur., 2 mi. SW Melvern, dry, TD 6,835 ft., Austin chalk 5,964-6,307 ft., sub-Clarksville 6,317-35 ft., Woodbine shale 6,495 ft., sand 6,660-6,835 ft.

Nacogdoches County: Warren Wright 1 N. O. Thomas, James Windsor Sur., 10 mi. NW Douglas, dry, TD 5,075 ft., Navarro 3,330 ft., Austin 4,656 ft., Woodbine 4,875 ft., no shows.

Navarro County: W. M. Coates et al 1 W. Livineston, Turner Smith Sur., 3 mi. NW Wortham, dry, TD 3,753 ft., Navarro chalk 950-1,080 ft., Pecan 1,260-1,932 ft., Wolf City 2,520-50 ft., Austin 2,775-3,275 ft., sub-Clarkeville 3,350-3,430 ft., Woodbine 3,696-3,751 ft., Buda 3,751

North Central Texas

(Continued from page 151)

Biffle, Cooke CSL, 1 mi. E Myra, dry, TD 1,926 ft., Ellenburger 1,907 ft.

J. R. & Adam Seitz 1 J. B. Pace, Erastus Yeoman Sur., 3½ mi. W Gainesville field, dry, TD 3,017 ft.

O. K. Ulrikson 1 J. A. Wylie, Thomas Cook Sur., 1 mi. NE Era, dry, TD 1,250 ft.

Comanche County: W. C. Estes 1 Ewell Ward, James Madison Sur., 12 mi. NW Comanche, dry, TD 2,849 ft., flowed some oil on DST 2,754-62 ft.

W. C. Estes 1 J. K. Ward, Carlos Hynes Sur., 12 mi. NW Comanche, dry, TD 2,383 ft., Caddo 2,282 ft., acidized with 5,000 gal.

Eastland County: Deep Rock Oil Corp. 1 J. J. Hawkins, Spires Donley Sur., 5½ mi. SE Ranger, dry, TD 3,801 ft., Caddo 2,285 ft.

Haskell County: T. D. Humphrey 1 H. M. Rike, Sec. 61, R. G. Cummings Sur., 7½ mi. NE Haskell, dry, TD 5,609 ft.

Mid-Continent Petroleum Corp. 1 R. E. McDonald, 52-1-H&TC, 5 mi. SW Haskell, dry, TD 5,800 ft., Swastika 2,698 ft., Ellenburger 5,701 ft.

Mid-Continent 1 Margaret Waldrop, Wm. Taylor Sur., 12 mi. SE Haskell, dry, TD 5,327 ft., KMA lime 3,834 ft., show of oil in sand 4,661 ft., Caddo 4,816 ft., Ellenburger 5,212 ft., elev. 1,504 ft.

Jones County: E. H. R. Sabens 1 P. M. Jones, Sec. 3, MEP&P Sur., ½ mi. E Anson, dry, TD 3,751 ft.

Lampasas County: H. G. Dickerson 1 B. R. Jones, J. R. Cook Sur. A-110, 2 mi. NW Lampasas, dry, TD 810 ft., Marble Falls 596 ft., light oil and gas show 672-678 ft.

McCulloch County: McDaniel & Beecherl 1 O. E. Helge, Sec. 9, TRR Sur., 1 mi. W Melvin, dry, TD 3,101 ft.

Mills County: Roche Oil Co. 1 W. E. Hargraves, W. R. Dobbins Sur., 10 mi. N Goldthwaite, dry, TD 3,515 ft., Ellenburger 3,235 ft., elev. 1,756 ft.

Palo Pinto County: Signal Oil & Gas Co. et al 1 J. T. Harrison, 12 mi. S Mineral Wells, dry, 4,695 ft., Ellenburger 4,655 ft.

Stephens County: G. E. Kadane & Sons 1-A Bradshaw, 4-5-T&P, 3 mi. W Caddo, dry, TD 2,697 ft.

Owenwood Pool 3 1 J. R. Hill, 13-2-SP, 3 mi. S Eliasville, dry, TD 3,310 ft., Caddo 3,202 ft.

Stewart Petroleum Co. 1 Della Holt, 44-4-T&P, 2½ mi. SE Caddo field, dry, 3,835 ft., Caddo 3,163 ft.

Taylor County: Robinson & Puckett 1 Hart, C. Warren Sur., 3½ mi. NE Tuscola, dry, TD 5,060 ft., Caddo 4,676 ft., Ellenburger 4,947 ft., elev. 2,078 ft.

Wichita County: Hale Cullum & West 1 J. H. Allison, W. Eaton Sur., 5 mi. W Wichita Falls, dry, TD 4,444 ft.

Young County: Henry Grace Production Co. 1 J. H. Chatem, Sec. 259, TE&L Sur., 7 mi. SE Olney, dry, TD 586 ft.

Permian Basin

(Continued from page 154)

Dalport Oil Corp. 1 Cordz & Juul, 101-8-H&GN, 4 mi. Grandfalls, dry, TD 2,013 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Stanolind Oil & Gas Co. 1 South Mattix Unit, 15-24s-37e, Ellenburger discovery, prepared for completion from the pay at 9,505-9,705 ft. Flowing tests, after 5,000 gal. of acid, have produced 114 bbl. of oil in 4 hours, through ¼-in. choke and 148 bbl. of oil an hour for 4 hours after an additional 2,000-gal. treatment from 9,570-9,620 ft. The latter gage was through open 2-in. tubing. At last report another injection of 2,000 gal. was made from 9,564-9,614 ft., after which the well flowed 465 bbl. of oil in 4 hours through 16/64-in. choke.

New pay in the Abo, or Wichita-Albany section, of Monument field was reported in Amerada Petroleum Corp.'s 6-D State. Flowing through ½-in. choke, from pay at 7,170-7,205 ft., the well gaged 136 bbl. of 36°-gravity oil, cut 3 per cent by water, in 24 hours. Gas-oil ratio was 526 cu. ft. Top of the Wichita-Albany was 6,955 ft., and total depth was 7,878 ft., in the Wolfcamp, with plugged-back depth at 7,213 ft. Monument-Abo has been suggested as the new field name.

Northwest of the Hobbs field, Phillips Petroleum Co. 1 Shipp, 20-18s-37e, was cleaning out after shooting the Glorietta at 5,982-6,015 ft. with 140 qt. of nitroglycin. Total depth was 12,626 ft. in pre-Cambrian, plugged back to 7,040 ft.

Northeast of the Crossroads field, Magnolia Petroleum Co. 1 Cox-Federal, 1-9s-36e, was plugged back to 9,760 ft., from 12,852 ft. A drill-stem test from 9,646-9,760 ft., using 2,000 ft. of water blanket, flowed the water cushion in 45 minutes, with oil, gas, mud and salt water following in 90 minutes.

Humble Oil & Refining Co. 1-X State, 31-11s-35e, which last week reported a flow of oil and gas emulsion, was drilling ahead below 10,422 ft. in lime. A drill-stem test from 10,077-144 ft., using 1,477 ft. of water blanket and open 3 hours and 10 minutes, recovered the water plus 4,110 ft. of salt water and 300 ft. of drilling mud slightly cut with gas. Bottom-hole flowing pressure was around 1,200 psi.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Amerada Petroleum Co. 1 Hamilton, NE SW 35-16s-38e, 9 mi. E of Lovington San Andres field, 6 mi. SW of Jones Ranch Devonian, Gaines County, Texas; flowed 935 bbl. 46.9°-gravity oil in 24 hr., ½-in. choke, top Devonian 12,446 ft., pay 12,518-600 ft., TD 12,656 ft., elev. 3,695 ft., GOR 180 cu. ft., TP 125 psi.

Eastern Kentucky

(Continued from page 153)

No showings have been reported to a depth of 2,200 ft. but operators are drilling ahead to the Big Six sand for possible gas production. Test is some 2 miles from the old Frozen Creek gas field.

One small producer was noted for the week in the Mine Fork pool of eastern Magoffin County. Red Rock Petroleum Co. 4 Jack Hunley on Twin Lick Creek was good for 1 bbl. per day from the Weir sand at a total depth of 1,108 ft.

There has been quite a letup recently in tests starting with the Knox dolomite of Cambro-Ordovician age as the objective. The almost 100 per cent failure of previous tests to establish anything like commercial production has led to a falling off in interest lately of wildcatting with the Knox as a possible reservoir rock. About a half dozen tests are now drilling in or towards this formation in the eastern part of Kentucky.

EASTERN KENTUCKY WILDCAT FAILURE

Menifee County: Roy Davis et al 1 Collingsworth, 20-Q-72, dry, TD 1,900 ft., Corniferous 1,220 ft., no shows.

INDIANA

EVANSVILLE.—Northern Pike County has new McClosky production in the area about 2 miles north of Petersburg and almost on the northern line of the county. The well, W. R. White 1 F. M. Neal, NW NW NW 13-1n-8w, flowed 14 bbl. in the first hour after plug was drilled and then settled to 10 bbl. per hour. Casing was set at 1,295 ft. and the McClosky pay called at 1,297-1,302 ft.

The area near North Owensville pool has been very active this year with extensions on the east and south sides of the pool. About 1 mile southwest of production in the pool, Ryan & Sharp 1 Elsie Lewis et al, SE SE NE 35-2s-12w, Gibson County, is showing as a producer from the O'Hara. Casing has been set to 2,530 ft. following a drill-stem test at 2,480-88 ft. which had gas in 3 minutes and flowing oil in 12 minutes. The Ste. Genevieve was called at 2,470 ft.

In the extreme southern part of Posey County, B. M. Heath is preparing for final tests at 1 S. L. Highman, SE SE SW 18-8s-13w, about 2 miles southeast of Spencer pool. On late reports, the well was making 14 bbl. per hour after 3 days. Pay is the McClosky at 2,630-36 ft., 2,675-2,700 ft., and 2,704-16 ft.

Illinois Mid-Continent Co. and V. & S. Drilling Co. 1 Nellie Walden, SW NW SE 3-5n-10w, Sullivan County, is preparing to perforate for tests of the Salem at 1,858-74 ft. On one of the drill-stem tests of the pay, the recovery was 720 ft. of oil and 30 ft. of oil-cut mud with no water. Casing has been set to 1,950 ft.

INDIANA WILDCAT FAILURES

Gibson County: Ashland Oil & Refining Co. et al 1 H. Fitch, SE SE SE 16-2s-11w, dry, TD 2,033 ft.

Posey County: Paul Rossi and Indiana Farm Bureau 1 Johnson, SE SE NW 24-6s-14w, dry, TD 2,980 ft.

Spencer County: Mulzer Brothers 1 Hart, SW SE SW 12-7s-8w, dry, TD 1,180 ft.

Sullivan County: G. H. Froderman 1 M. Moore, NW NW NE 10-9n-9w, dry, TD 2,226 ft.

Warrick County: D. F. Garlington 1 McNeely, NE SE NE 4-6s-9w, dry, TD 1,308 ft.

ADVERTISERS

Allegheny Ludlum Steel Corp. 114
Allied Steel Products Corp. 108
Allis-Chalmers 45
Allen's Foundry & Machine Works 140
Aluminum Co. of America 25
American Iron & Machine Works Co. 137
Anderson Co., The V. D. 97
Axelson Manufacturing Company 39
Badger & Sons Co., E. B. 107
Baird Mfg. Co. 146
Baker Oil Tools, Inc. 52
Barnes Manufacturing Co. 19
Barrett Division, Allied Chemical & Dye Corp. 116
Beech Aircraft Corp. 11
Bethlehem Steel Co. 1
Bovaird Supply Co., The 29
Boyd Co., Clarence L. 142
Broderick & Bascom Rope Co. Back Cover
Brown & Root, Inc. 2
Cameron Iron Works, Inc. 85
Carnegie-Illinois Steel Corporation 99
Carter Co., Ralph B. 103
Cessna Aircraft Company 43
Chevrolet Motor Div., General Motors Corp. 14
Chicago Pneumatic Tool Company 26
Classified Advertising 176, 177, 178
Cleveland Trencher Company 123
Continental Motors Corp. 38
Coppus Engineering Corp. 3
Crane Co. 7
Crose Manufacturing Company, Inc., M. J. 124
Crutcher-Rolfs-Cummings 123
Curtin & Co., Inc., W. H. 130
Dallas Tank Company 18
Davis Engineering Corp. 96
Dean Brothers Pumps, Inc. 100
Dowell Incorporated 127
Dragon Mfg. Co. 152
Dresser Industries, Inc. 41, 47
du Pont 17
Emerol Manufacturing Co., Inc. 134
Enterprise Engine & Foundry Co. 151
Extruders, Inc. 136
Falstrom Company 130
Fischer & Porter Co. 100
Fisher Governor Company 80
Four Wheel Drive Auto Co., The 34
General Electric Company 76, 77
General Manufacturing Company, The 125
General Paint Corporation 9
Goodrich Company, B. F. (Hycar) 74
Grancell, I. H. 135
Grinnell Company, Inc. 40
Gunite Concrete & Construction Co. 130
Halliburton Oil Well Cementing Co. Inside Front Cover
Happy Company, The 72
Harvey & Co., Ltd., G. A. 78
Haynes Stellite Company 8
Hazard Wire Rope Division of American Chain & Cable Co., Inc. Inside Back Cover
Hill-Hubbell & Co. 9
Huber Corp., J. M. 148
Hughes Tool Co. Front Cover
International Nickel Company, Inc., The 13
Johns-Manville Corporation 111
Jones & Laughlin Supply Co. 36, 37
Kaydon Engineering Corp., The 48
Kelley Co., Inc., Ben F. 153
Kinzbach Tool Company, Inc. 150
K-L-M Royal Dutch Airlines 134
Koch Engineering Company, Inc., The 128
Lane-Wells 48
Latex Construction Company 128
Leeds & Northrup Co. 5
Leland Equipment Company 147
Line Scale Co., Inc. 136
Lloyd Metal Foundry Co. 124
Lone Star Cement Corporation 50
Manzel, Inc. 104
Martin Iron Works 152
Maxim Silencer Co., The 131
McCord Corporation 120
McEvoy Company 161
McNamar Boiler & Tank Co. 167
Mission Mfg. Co. 133
Murphy, Frank W. 87
National Airoil Burner Co., The 130
National Supply Co., The 89, 90, 91
National Tank Company 82, 83
National Transit Pump & Machine Co. 44
Nelson Electric Manufacturing Co. 110
Norris Brothers, Inc. 145
Oakite Products, Inc. 143
Oil and Gas Journal, The 150, 154
Oil Center Tool Co. 149
Oil Industry Information Committee 28
Onan & Sons, Inc., D. W. 143
Oshkosh Motor Truck, Inc. 23
Otis Pressure Control, Inc. 31
Pacific Pumps, Inc. 47, 145
Paddock Sales of Texas 146
Page Fence Association 153
Panalarm Products, Inc. 129
Peerless Pump Division of Food Machinery and Chemical Corp. 12
Penberthy Injector Co. 124, 129, 135, 142, 146, 152
Penn Electric Switch Co. 144
Perrault Brothers, Inc. 126
Petroleum Distributing Company 136
Pittsburgh Corning Corporation 21
Powell Co., The Wm. 20
Pure Oil Co., The 35
Railway Express Agency, Air Express Division 85
Rector Well Equipment Co., Inc 152
Reed Roller Bit Company 141
Refinery Engineering Co., The 10
Ross-Martin Co. 136
Rust-Oleum Corporation 101
Scott-Rice Company 146
Security Engineering Co., Inc. 168, 169
Shaffer Tool Works 164
Shand & Jurs Co. 4
Smith Contracting Corp. 122
Smith Corporation, A. O. 6
Smith Oil Tool Co., H. C. 121
Southern Mill & Mfg. Co. 84
Spang-Chalfant Division of The National Supply Co. 92
Spencer Chemical Company 112
Spicer Mfg. Co. 27
Stacey Bros. Gas Construction Co. 41
Standard Oil Co. of New Jersey 15
Standco Brake Lining Co. 136
Sun Engineering Co. 97
Tapecoat Company, The 126
Thomas Flexible Coupling Co. 109
Thornhill-Craver Co. 156
Timken Roller Bearing Company 42
Torrington Company, The 24
Twin Disc Clutch Co. 30
Ultra Violet Products, Inc. 145
Union Carbide & Carbon Corp. 8
U. S. Steel Corp. Subsidiaries 99, 131, 138
United States Steel Supply Company 131
United Supply & Manufacturing Co. 94
Universal Atlas Cement Co. 138
Vapor Recovery Systems Co., The 22
Washington Engine & Pump Co. 100
Westinghouse Electric Corp. 32, 33
Wheatley Pump & Valve Mfr., Frank 162
Willson Products, Inc. 112
Wilson Oil Tools, Web 134
Worthington Pump & Machinery Corp., Pump and Compressor Merchandising Division 16
Youngstown Sheet & Tube Co. 71

CALENDAR

May

American Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

Fourth Annual Short Course in Gas Technology, sponsored by Southern Gas Association, Texas A. & I. College, Kingsville, May 30-June 1.

June

Petroleum Equipment Supplier's Association, annual meeting Broadmoor Hotel, Colorado Springs, Colo., June 5-7.

Society of Automotive Engineers, summer meeting, French Lick Springs Hotel, French Lick, Ind., June 5-10.

National Oil Scouts and Land Men's Association, annual meeting, Shamrock Hotel, Houston, June 9-11.

Canadian Gas Association, annual convention, Bigwin Inn, Lake of Bays, Ont., Canada, June 16-20.

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J., June 17-July 1.

Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh, Pa., June 16-17.

Kentucky Oil & Gas Association, annual meeting, Hotel Lafayette, Hotel Phoenix, Lexington, Ky., June 23-24.

American Society of Mechanical Engineers, semiannual meeting, University of California Extension Building, San Francisco, June 27-30.

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Gas Association, annual convention, Chicago, September 17-20.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 18-20.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

American Institute of Mining and Metallurgical Engineers, regional meeting, Neil House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 26-30.

October

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

American Gas Association, annual convention, Chicago, October 17-20.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Elk's Club, Los Angeles, October 20-21.

Independent Natural Gas Association of America, annual meeting, Baker Hotel, Dallas, October 31.

November

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 7-10.

American Society of Mechanical Engineers, annual meeting, Hotel Statler, New York, November 27-December 2.

December

American Institute of Chemical Engineers, annual meeting, William Penn Hotel, Pittsburgh, Pa., December 4-7.

NOMADS

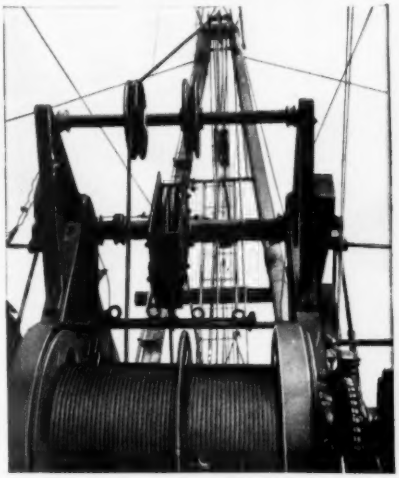
Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

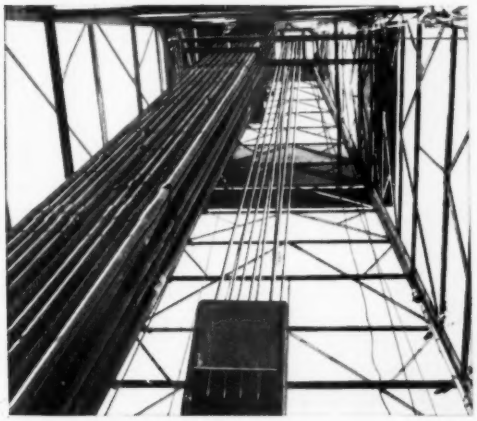
TABLE OF CONTENTS ON PAGE 51

Improved Performance with LAY-SET PREFORMED

There's a wire line that resists the whipping of sucker rod and tubing lines running at high speeds. It's LAY-SET Preformed. And how it stands up under shock loads when it is stopped suddenly! Yes, LAY-SET has been the favorite for years because it offers *improved performance.*



Cable tool drilling lines are jerked, whipped and snapped. Clean-out lines run at high speeds and rub against the casing much of the way down or up. These lines must be designed for the job or they won't last long. HAZARD has cable tool lines that are engineered for longer life. They cost less to use.



On the rotary drilling rig the driller calmly throws a lever. Up shoots the string of pipe. Suddenly it stops. The whole derrick shakes. A 100-ton strain, or more, may be placed on the line. It must be good . . . and LAY-SET Preformed rotary drilling lines are good. They can take it . . . and run up greater ton-mile records.

HAZARD'S two great oil field ropes are LAY-SET Preformed and NONPARELL non-preformed. Each is designed to give improved performance on certain jobs. Each has many years of engineering and field experience built into its design. You will improve the performance of your equipment by insisting on HAZARD oil field ropes.

You're never far from a stock of LAY-SET Preformed or NONPARELL non-preformed. There are HAZARD distributors in all important oil fields. They will give you quick service and top quality lines.

ACCO
In Business for Your Safety

LAY-SET Preformed GREEN STRAND WIRE ROPE

HAZARD WIRE ROPE
A DIVISION OF AMERICAN CHAIN & CABLE

TRADE MARK

Wilkes-Barre, Pa., Chicago, Denver, Houston, Los Angeles, Pittsburgh, San Francisco, Wichita, Bridgeport, Conn.

ALL FOR ONE!

There's no letup for oil field equipment. It looms large in the building of an even more productive America—all industry's goal. As much as ever, therefore, you need the firm grip on wire line operations that *Preformed* Yellow Strand provides. Let its stout steel wires handle your heavy drill strings securely. Use its limberness to speed pipe-laying . . . to fight fatigue on winches . . . to simplify erection jobs. The long-lasting wire line is the *economical* line. Specify *Preformed* Yellow Strand by name.

Broderick & Bascom Rope Co.
St. Louis

Houston Branch: 1311 Palmer St.

THE CONTINENTAL SUPPLY CO.
Mid-Continent Distributors
Stores Located in All Active Fields

THE REPUBLIC SUPPLY CO.
of California
Oil Field Distributors for Calif.

THE McJUNKIN SUPPLY CO.
Charleston
West Virginia

BRODERICK & BASCOM
Yellow Strand
PREFORMED ROTARY LINE